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TEXTILE DESIGNERS'

Pocket Manual

BY

WALTER SCOTT

FOURTH AND ENLARGED EDITION
PRICE $1.00

GREAT IS THE GIFT THAT BRINGETH KNOWLEDGE

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Published by

AMERICAN WOOL AND COTTON REPORTER

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Publishers' Announcement.

These chapters on textile designing were published in instalments in the AMERICAN WOOL AND COTTON REPORTER, beginning with the issue of November 17, 1910. The author, Mr. Walter Scott, formerly of Cornwall, Ont., intended that they should be gathered together and bound in the form of a small pocket manual, and we have therefore issued them in the present form, which will be found convenient for every day use.

Copies of this work will be sent, postage prepaid, to any address, on receipt of one dollar at any of our offices.

FRANK P. BENNETT & CO., Inc.,
Publishers.

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INTRODUCTION

As this work is intended for the de-
signer alone, I have confined myself
chiefly to that department. Designing
is probably the most ancient of all the
arts. Primitive man, as we understand,
designed and made his first garment
in the garden of Eden. We find as time
moved on that the innate vanity of
the human species began to show it-
self in the addition of various orna-
ments to the dress, and thus begun,
designing has been more and more
developed as ages have rolled by,
each designer showing his individual-
ity in the construction of innumerable
articles designed for useful and orna-
mental purposes; and textile design
has ever been a leading art.   As a
witness thereof, take the tapestries
of the Middle Ages, some of which
show most artistic conceptions in de-
sign and execution; also take the
shawls of India.   Consider the pres-
ent age.   How much less satisfactory

would life be without the beautiful
fabrics which are originated in the de-
signers' brain, and produced by the
loom.   How much less attractive
would be woman without the beautiful
creations of textile art that aid in her
adornment.   Art in the form of silks,
velvets, laces, etc., will make the most
plain attractive.   It may be stated,
therefore, with good reason, that tex-
tile designing is really the oldest, and
at the same time, one of the most im-
portant of the arts.

A true designer must of necessity
have a creative fancy, else where
would he originate his designs?   He
also must have a natural taste, I will
not say for the beautiful alone, for the
sublime, the grotesque and the ugly
have their places in man's creative
fancy as well as the beautiful, and
each has its own votaries, but a natu-
ral taste for one or the other is essen-
tial to the designer. I believe that a
good deal of the art of design can be
acquired, but to have it in perfection,
or at least as near perfection as man
ever reaches here below, it must be
inborn and then cultivated.

It is a source of pain to see how this
art has degenerated in textile fabrics.

more especially on this continent. It
is a disgrace to the name of designer
to be reduced to the mere level of
copyists, as is the rule rather than
the exception in America. I am pub-
lishing this work not as a help to
such, but in the hope that the practical
rules, etc., contained herein, which
have been gained by practical experi-
ence in Scotland, England, Canada
and the United States, may be of
some value to the true born and as-
piring designer just starting out on
life's work. That he may herein find
help to overcome some of the diffi-
culties that beset us in our profes-
sion, and help to again raise our art
to its proper place in the world, is
the earnest wish of

<div align="right">THE AUTHOR.</div>

CHAPTER 1.

DESIGN PLATES.
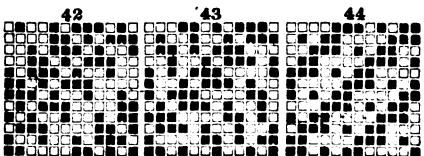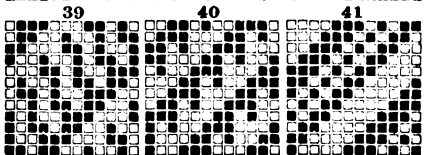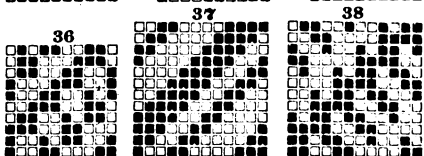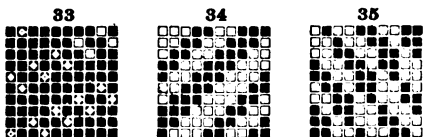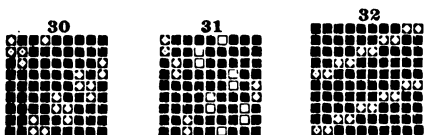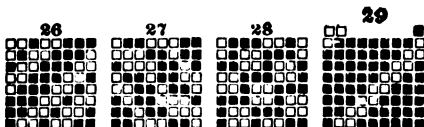
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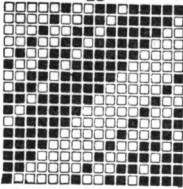
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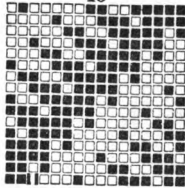
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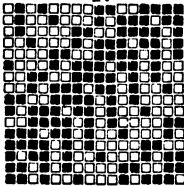
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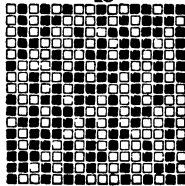
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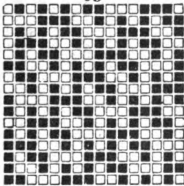
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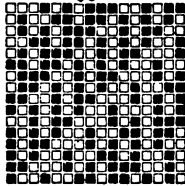
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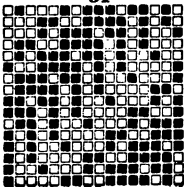
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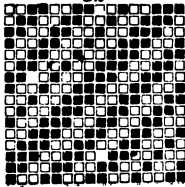
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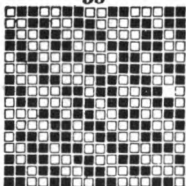
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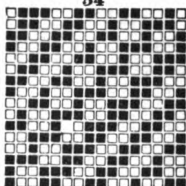
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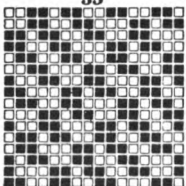
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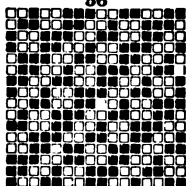
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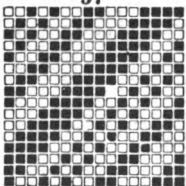
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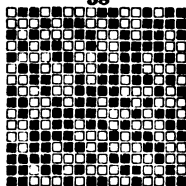
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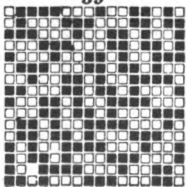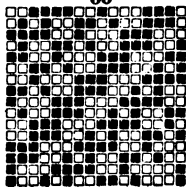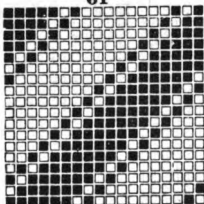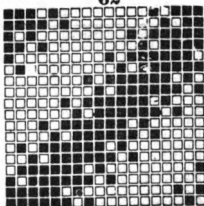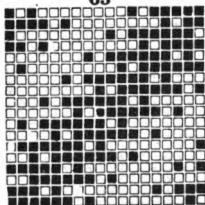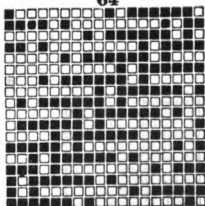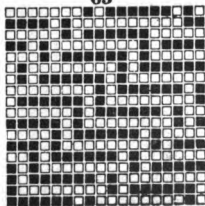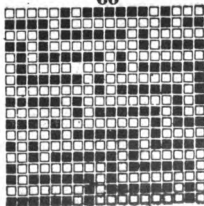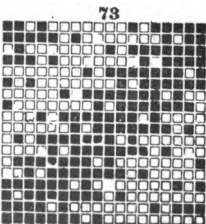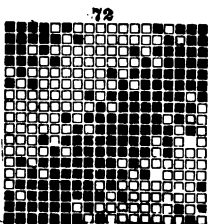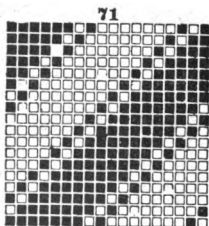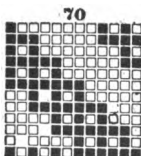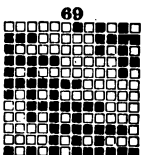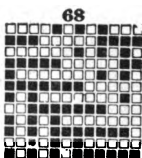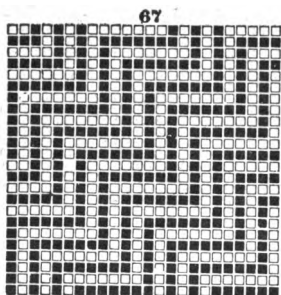
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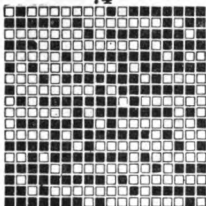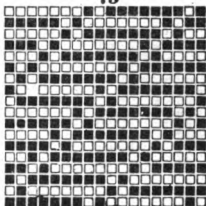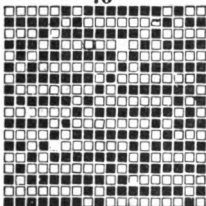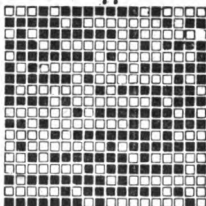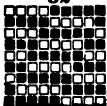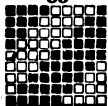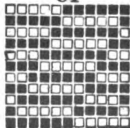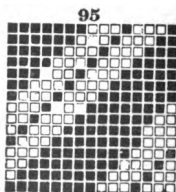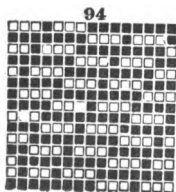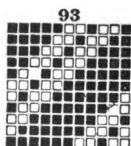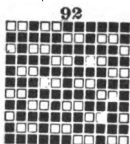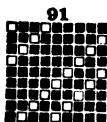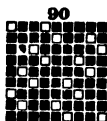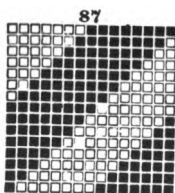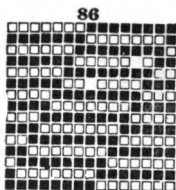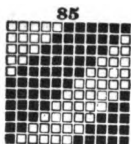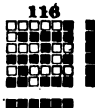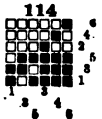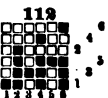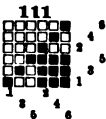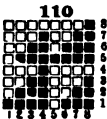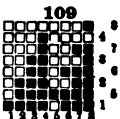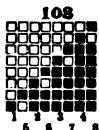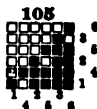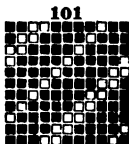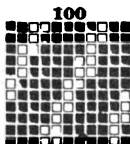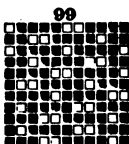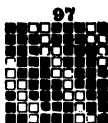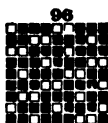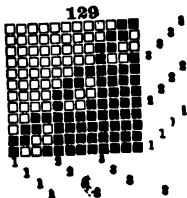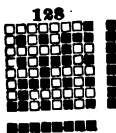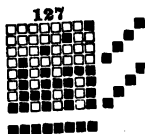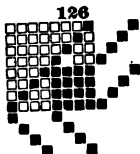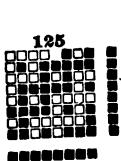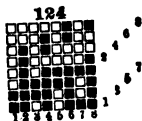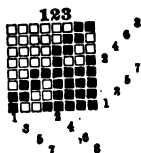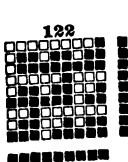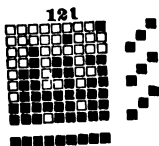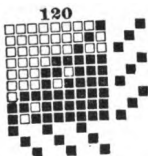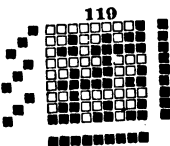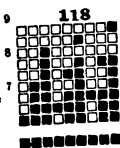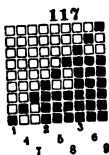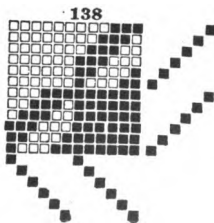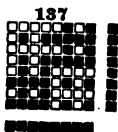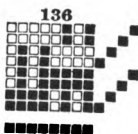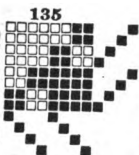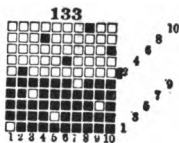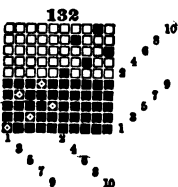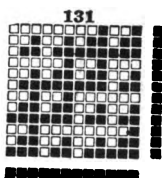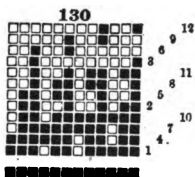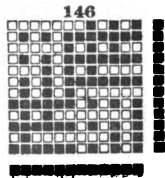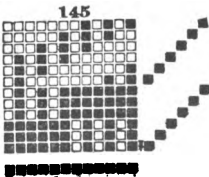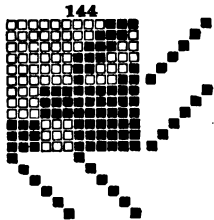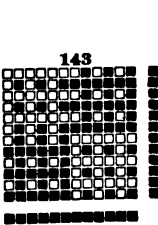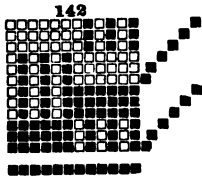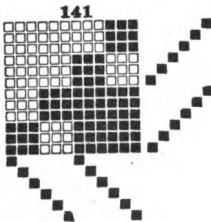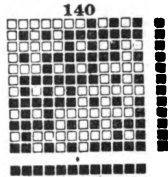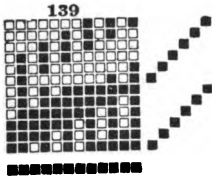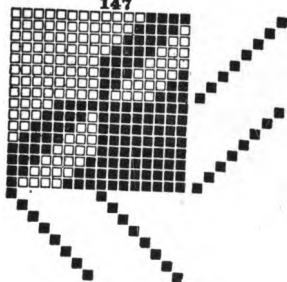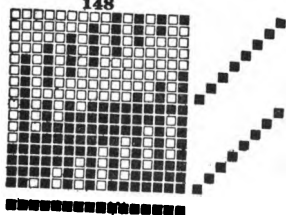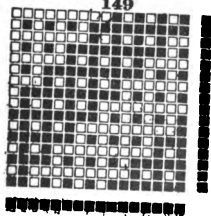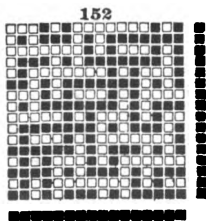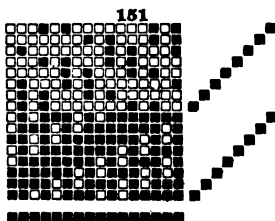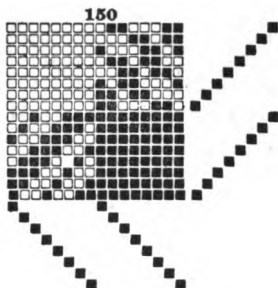
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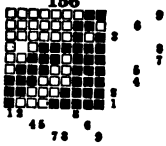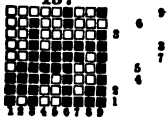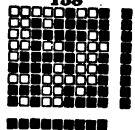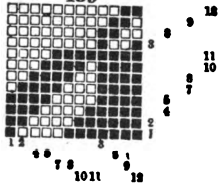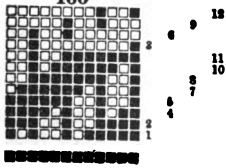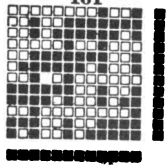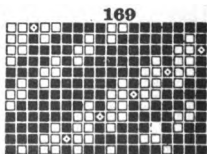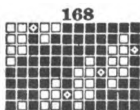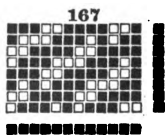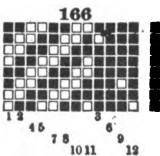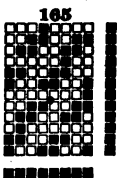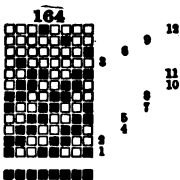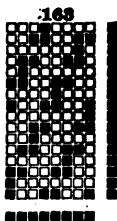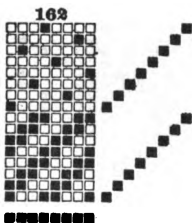
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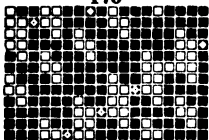
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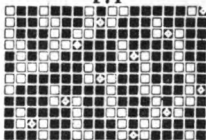
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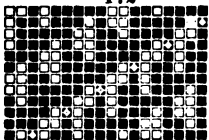
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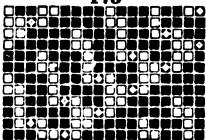
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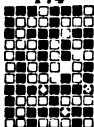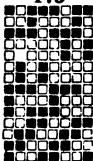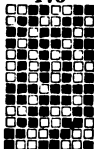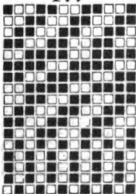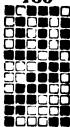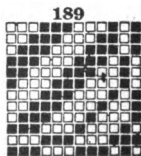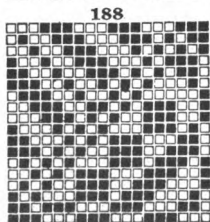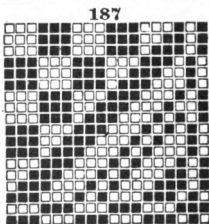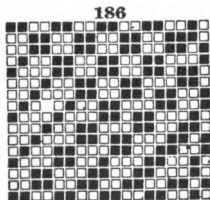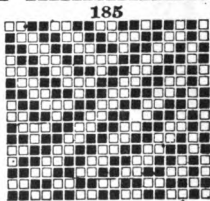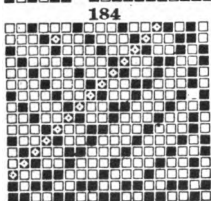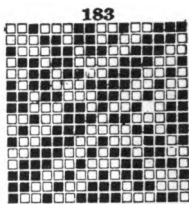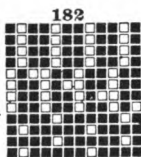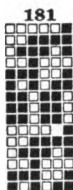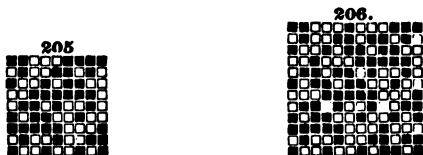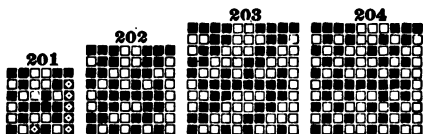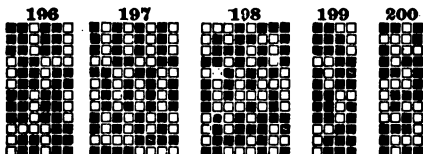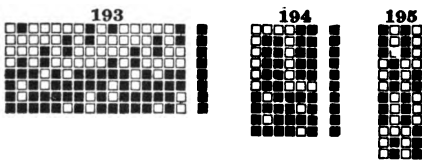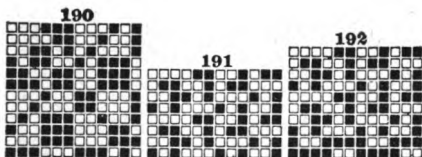
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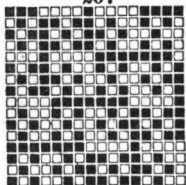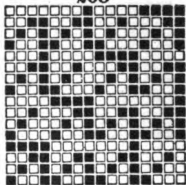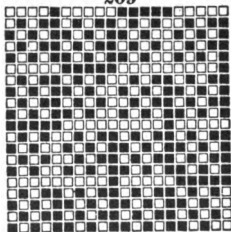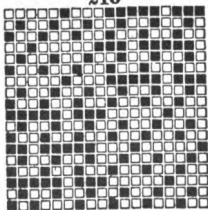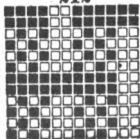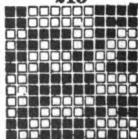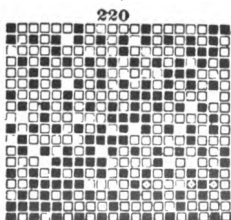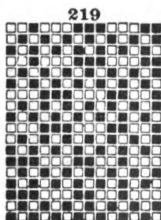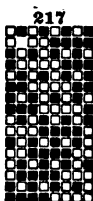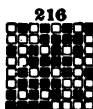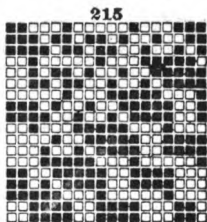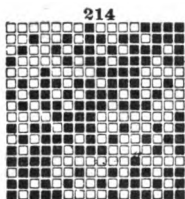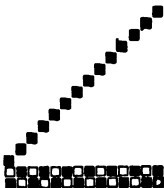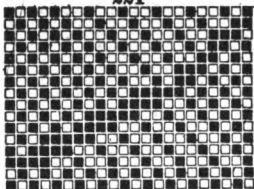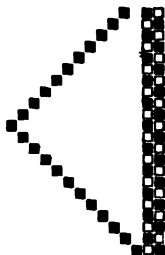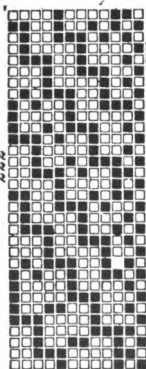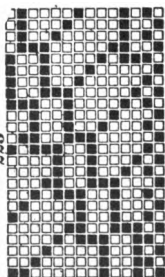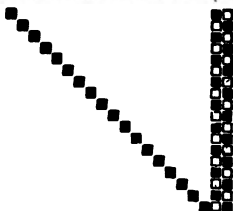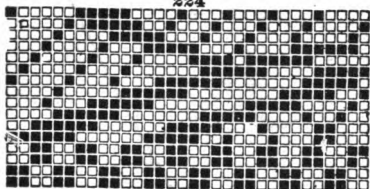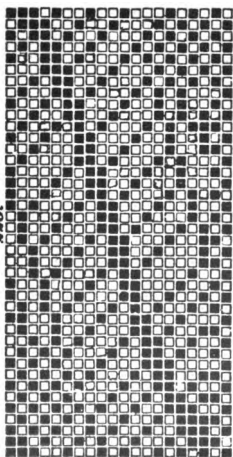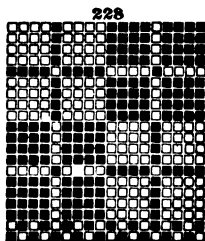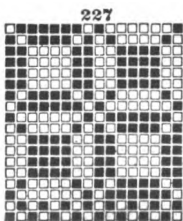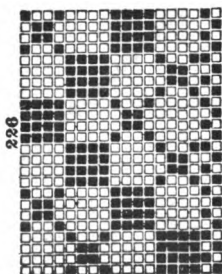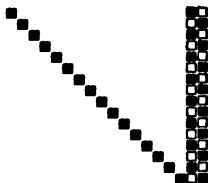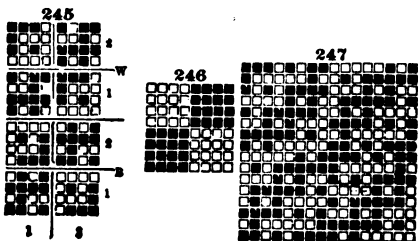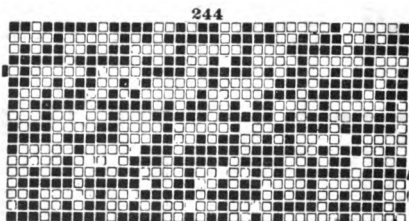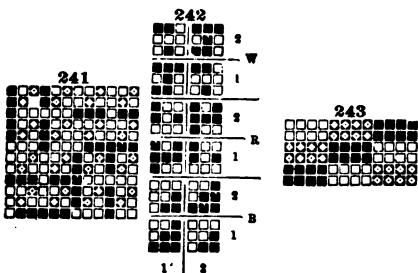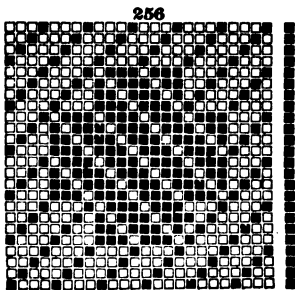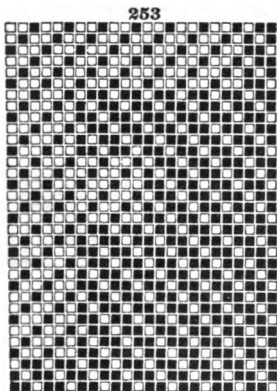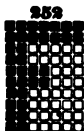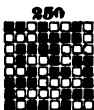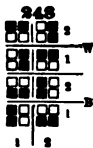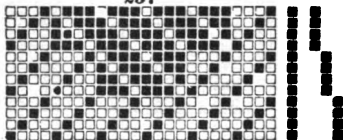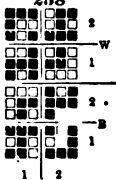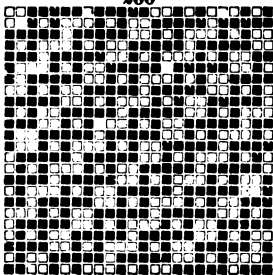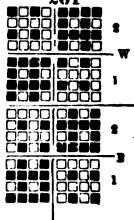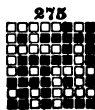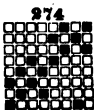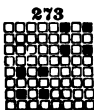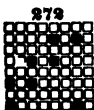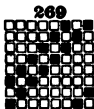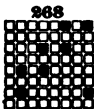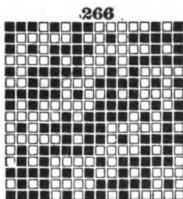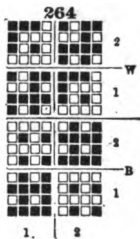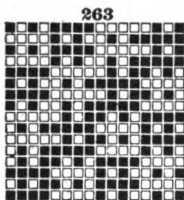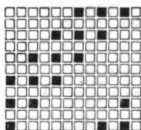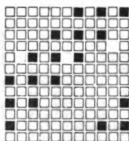
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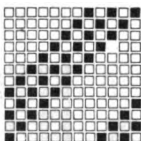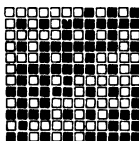
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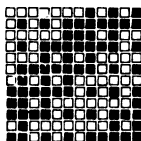
CHAPTER II.

EXPLANATION OF WEAVES

N. B.   Where there are no drafts given
with the weaves they are straight draws.

1 is a plain cloth.
2 is a 3-harness filling twill.
3 is a 3-harnesss warp twill.
4 is a 4-harness twill or common twill.
5 is a 4-harness filling or crow twill.
6 is a 4-harness warp or inverted crow
   twill.
7 is a 5-harness filling twill 3 and 2.
8 is a 5-harness warp twill 3 and 2.
9 is a 5-harness inverted crow twill.
10 is a 5-harness doeskin being a trans-
   position of 9.
11 is a 6-harness twill.
12 is a 6-harness twill with herring bone
   draft.
13 is a 6-harness twill diaper using same
   draft as 12.
14 is a 7-harness filling twill 4 and 3.
15 is a 7-harness warp twill 4 and 3.
16 is a 7-harness doeskin.
17 is an 8-harness twill.
18 is a transposition of 17.
19 is a transposition of 18.

20 is an 8-harness warp twill.
21 is an 8-harness doeskin being a transposition of 20.
22 is an 8-harness doeskin being transposition of 21.
23 is an 8-harness Russian twill.
24 is a transposition of 23.
25 is a transposition of 24.
26 is another 8-harness Russian twill.
27 is a transposition of 26 and commonly called Mayo twill.
28 is a transposition of 27.
29 is a 9-harness warp twill 7 and 2.
30 is a transposition of 29.
31 is a transposition of 30.
32 is a 5-harness warp twill 27 degree.
33 is a transposition of 32.
34 is a 10-harness Russian twill.
35 is a transposition of 34.
36 is a transposition of 35.
37 is a 12-harness Russian twill.
38 is a transposition of 37.
39 is a transposition of 38.
40 is a transposition of 39.
41 is another style of 12-harness Russian twill.
42 is a transposition of 41.
43 is a transposition of 42.
44 is a transposition of 43.
45 is a 16-harness Russian twill.
46 is a transposition of 45.
47 is a transposition of 46.
48 is a transposition of 47.
49 is a transposition of 48.
50 is a transposition of 49.
51 is a transposition of 50.
52 is another 16-harness Russian twill.
53 is a transposition of 52.
54 is a transposition of 53.
55 is a transposition of 54.
56 is a transposition of 55.
57 is another 16-harness Russian twill.
58 is a transposition of 57.
59 is a transposition of 58.
60 is a transposition of 59.
61 is one of the original twills from which a double twill is derived.
62 is a transposition of 61.
63 is a transposition of 62 showing edged twill.
64 is a transposition of 63 showing double twill.
65 is a transposition of 64 showing another formation of double twill.
66 is a transposition of 65 showing another formation of double twill.

67 is a 24-harness double twill, 12-harness and 12 bars will do this.
68 is a 67 reduced and transposed.
69 is a 68 transposed.
70 is a 69 transposed.
71 is another original twill from which the double twill is derived.
72 is the first transposition.
73 is the second transposition.
74 is the third transposition.
75 is the fourth transposition.
76 is the fifth transposition.
77 is the sixth transposition.
78 is a 5-harness corkscrew.
79 is a Russian twill.
80 is a 7-harness corkscrew.
81 is a 7-harness warp twill from which the corkscrew 80 is transposed.
82 is a 9-harness corkscrew.
83 is a 9-harness warp twill from which 82 is transposed.
84 is an 11-harness corkscrew.
85 is the original twill from which 84 is transposed.
86 is a 15-harness corkscrew.
87 is the original twill from which it is transposed.
88 is a broken corkscrew 7-harness.
89 is the original from which it is transposed.
90 is a broken corkscrew 9-harness.
91 is the original from which it is transposed.
92 is an 11-harness flat corkscrew.
93 is the original from which it is transposed.
94 is a 15-harness flat corkscrew.
95 is the original from which it is transposed.
96 is a 9-harness broken corkscrew of another form.
97 is the intermediate transposition of 96 and 98.
98 is the original twill from which 96 is derived.
99 is an 11-harness broken corkscrew.
100 is the original transposition of 99 and 101.
101 is the original twill from which 99 is derived.
102 is a double plain drawn in and woven as shown.
103 is a chain transposition of 102 drawn in as shown and woven straight.
104 is a draft transposition of 103 drawn in and woven straight.
105 is a 3-ply plain cloth.
106 is a chain transposition of 105.

107 is a draft transposition of 106 unbound.
108 is a 4-ply plain cloth.
109 is a chain transposition of 108.
110 is a draft transposition of 109 unbound.
    See rule for binding.
111 is a 3-harness filling twill double cloth.
112 is a chain transposition of 111.
113 is a draft transposition of 112.
114 is a 3-harness warp twill double cloth.
115 is a chain transposition of 114.
116 is a draft transposition of 115
117 is a 3-harness filling twill 3-ply fabric.
118 is a chain transposition of 117.
119 is a draft transposition of 118
120 is a 3-harness warp twill face and
    middle and a filling twill back.
121 is a chain transposition of 120.
122 is a draft transposition of 121.
123 is a common twill double cloth.
124 is a chain transposition of 123.
125 is a draft transposition of 124.
126 is a 4-harness crow double cloth.
127 is a chain transposition of 126.
128 is a draft transposition of 127.
129 is a common twill 3-ply fabric.
130 is a chain transposition of 129.
131 is a draft transposition of 130.
132 is a doeskin double cloth (5-harness).
133 is a chain transposition of 132.
134 is a draft transposition of 133.
135 is a 2 pick basket double cloth.
136 is a chain transposition of 135.
137 is a draft transposition of 136.

N. B. the second transposition makes all
of these double cloths straight-draw and
straight-chain: they are all separate
cloths, no binders being put in so as to be
easier understood by learners (see rule
for binding).

138 is a 6-harness twill double cloth.
139 is a chain transposition of 138.
140 is a draft transposition of 139.
141 is a 3-pick basket double cloth.
142 is a chain transposition of 141.
143 is a draft transposition of 142
144 is a 3-pick basket face and a 6-harness
    twill back.
145 is a chain transposition of 144.
146 is a draft transposition of 145.
147 is an 8-harness twill double cloth.
148 is a chain transposition of 147.
149 is a draft transposition of 148.
150 is a Russian twill face and a Mayo
    twill back.

151 is a chain transposition of 150.

152 is a draft transposition of 151.

153 is a common twill face and a plain back (⅓ back).

154 is a chain transposition of 153.

155 is a draft transposition of 154.

156 is a 6-harness twill face and a 3-harness twill back.

157 is a chain transposition of 156.

158 is a draft transposition of 157.

159 is an 8-harness twill face and a 4-harness twill back.

160 is a chain transposition of 159.

161 is a draft transposition of 160.

162 is a common twill face and a satin warp back.

163 is 162 transposed to a straight draw.

164 is a common twill face and a satin ⅓ warp back.

165 is 164 transposed into straight draw.

166 is a common twill face and a filling back 2 and 1.

167 is 166 transposed into straight chain.

168 is an 8-harness filling back 2 face and 1 back.

169 is a 12-harness Russian twill filling back 2 and 1.

170 is a transposition of 169 face with filling back.

171 is a transposition of 170 face with filling back.

172 is a transposition of 171 face with filling back.

173 is a transposition of 172 face with filling back.

174 is a double plain and filling rib combination.

175 is a double plain and filling rib and common twill combination.

176 is a warp crow and filling rib and common twill combination.

177 is a 27 degree twill filling rib and common twill combination.

178 is a warp broachie and filling rib combination.

179 is a warp broachie and filling rib combination.

180 is a 6-harness twill and filling rib combination.

181 is a half back and filling rib combination.

182 is a warp broachie and filling rib combination with filling back.

183 is a Russian twill and a Mayo twill combination.
184 is a cut weave.
185 is a cut weave combination.
186 is a cut weave combination.
187 is a cut weave combination.
188 is a cut weave combination.
189 is a cut weave combination.
190 is a cut weave combination.
191 is a cotton warp 2 face and 1 back wool filling.
192 is a cotton warp 2 face and 1 back with wool stripe.
193 is a cotton and wool warp 4 and 4 cotton in rib.
194 is a cotton and wool warp 4 and 6 cotton in rib.
195 is a coton warp filling rib.
196 is 195 with filling back.
197 is cotton warp rib with wool stripe.
198 is cotton warp rib with wool twills.
199 is a 4 colored filling stripe.
200 is a double plain cord.
201 is a 2 fine and 1 coarse plait plain ground.
202 is a 3 fine and 1 coarse plait 3-harness twill ground.
203 is a 4 fine and 1 coarse plait 4-harness twill ground.
204 is a 4 fine and 1 coarse plait plain ground.
205 is a 2 fine and 1 coarse plait plain ground.
206 is a 2 fine and 1 coarse plait plain ground.
207 is a 3 fine and 1 coarse plait plain ground.
208 is a 3 fine and 1 coarse plait 3-harness filling twill ground.
209 is a 4 fine and 1 coarse plait plain ground.
210 is a 2 fine and 1 coarse plait plain ground.
211 is a 2 plain ground and 2 plait all same size warp.
212 is a 4 plain ground and 2 plait all same size warp.
213 is a 4 common twill ground 2 plait all same size warp.
214 is a 3 fine and 1 coarse plait plain and 3-harness twill ground.
215 is a 2 fine and 1 coarse plait plain and basket ground.

216 is a 1 fine and 1 coarse warp flushing plain ground.
217 is a 1 fine and 1 coarse warp flushing plain ground.
218 is a 2 fine and 1 coarse warp flushing plain ground.
219 is a 2 fine and 1 coarse warp flushing plain ground.
220 is a 1 fine and 1 coarse warp flushing plain ground.
221 is a 1 fine and 1 coarse warp flushing plain ground.
222 is a 2 fine and 1 coarse warp flushing plain ground.
223 is a 1 fine and 1 coarse warp flushing plain ground.
224 is a 1 fine and 1 coarse warp flushing celtic ground.
225 is a 1 fine and 1 coarse warp flushing plain ground.
226 is a 1 fine and 1 coarse warp flushing plain ground.
227 is a 1 fine and 1 coarse warp flushing plain ground.
228 is a 1 fine and 1 coarse warp flushing plain ground.
229 is a plain and 4 pick basket combination dress goods.
230 is a plain and plait combination dress goods
231 is a plan from which to make any figure in plain cloth.
232 is a basket figure (see rule for figure weaving).
233 is a 232 figure (the weave made from 231 plan to make).
234 is as 233 shows in fabric.
235 is another figure.
236 is the weave for 235.
237 is as it will show in fabric.
238 is a plan from which to make any figure in 2 fine and 1 coarse plait.
239 is the figure.
240 is a weave for figure 239.
241 is as 240 will show in fabric.
242 is a plan from which to make any figure in 3 ply and 3 colors.
243 is a figure.
244 is the weave for 243.
245 is a plan from which to make any figure in combination twill double cloth.
246 is a figure.

247 is the weave for figure 246 made from plan 245.

248 is a plan from which to make any figure in double plain.

249 is a figure.

250 is the weave for figure 249 made from plan 248.

251 is a plan from which to make any figure in 3-harness and inverted twill.

252 is a figure.

253 is the weave for figure 252 made from plan 251.

254 is a plan from which to make any figure in crow and inverted crow.

255 is a figure.

256 is the weave for figure 255 made from plan 254.

257 is 256 reduced to 12-harness (see rule for reducing).

258 is a plan from which to make any figure in 3-harness twill double cloth.

259 is a 6-harness twill figure.

260 is the weave for figure 259 made from plan 258

261 is a plan from which to make any figure in 2 pick basket double cloth.

262 is a combination twill figure.

263 is the weave for figure 262 made from plan 261.

264 is a plan from which to make any figure in basket face and twill back.

265 is a figure.

266 is the weave for figure 265 made from plan 264.

267 is the face weave of a combination twill double cloth.

268 is the back weave of a combination twill double cloth.

269 is the back and face weave combined.

270 is 269 with all the face raised when back pick goes in.

271 is 270 with binders.

272 is the face weave combination twill.

273 is the back weave 2 pick basket.

274 is 272 and 273 combined.

275 is 274 with all face raised when back pick goes in.

276 is the face weave of a 6-harness twill double cloth.

277 is the back weave of a 6-harness twill double cloth.

278 is 276 and 277 combined.

279 is 278 with all face up when back pick goes in.

280 is 279 bound.

CHAPTER III.

WARPING AND WEAVING PARTICULARS

For Weaves Given in Design Plates

	Thds.	Reed.	P'ks.	Wth.	Weave.	Weight.	Size
Cassimeres	1,080	15-2	30	36	1	6 oz.	4 run.
Cassimeres	810	11½-2	28	35	1	6 oz.	2¾ r'ton.
Cassimeres	648	9-2	18	36	1	10 oz.	1.45 r'ton.
Cassimeres	540	7-2	15	36½	1	12 oz.	1.00 r'un.
Worsteds	2,020	15¾-4	62	33	1	4 oz.	No. 3¾ wor.
Worsteds	1,340	10½-4	43	33	1	6 oz.	No. 1½ wor.
Worsteds	1,020	16-2	32	33	1	6 oz.	No. 8 wor.
Tweeds	940	14-2	23	34	1	8 oz.	2.50 run.
Tweeds	720	10½-2	21	34	1	8 oz.	2.00 run.
Tweeds	580	8½-2	17	33½	1	10 oz.	1.25 run.
Cheviot	840	12½-2	25	33	1	8 oz.	3.00 run.
Cheviot	624	9½-2	19	33½	1	8 oz.	1.70 run.
Cheviot	510	7½-2	15	33½	1	10 oz.	1.10 run.
Chev. dress bric.	510	8-2	14	33	1	4 oz.	3.00 run.
Chev. dress bric.	450	14-1	14	32	1	4¼ oz.	2.25 run.
Chev. dress bric.	400	12½-1	13	33	1	5 oz.	1.80 run.
Chev. dress bric.	370	11½-1	12	33	1	5½ oz.	1.55 run.
							Warp. / Filling.
Unions	1,640	15-3	45	36½	1	4 oz.	No. 18 cott. / 9 run

Unions	1,440	13½-3	40	36½		6	oz.	No. 16 cott. | 4 run
Unions	1,220	17-2	34	36	1	8	oz.	No. 14 cott. 2.25 run
Unions	1,060	14½-2	30	36½	1	10	oz.	No. 12 cott. 1.45 run
Cotton or silk	1,860	570-4	62	29	1	4	oz.	No. 20 cotton.
Cotton or silk	1,460	450-4	50	29	1	5	oz.	No. 12 cotton.
Cotton or silk	1,220	375-4	42	29	1	6	oz.	No. 9 cotton.
Cotton or silk	1,040	325-4	36	29	1	7	oz.	No. 7 cotton.
Cotton or silk	920	285-4	32	29	1	8	oz.	No. 5 cotton.
Cassimeres	320	12½-3	37	35½	2 & 3	7	oz.	4.20 run.
Cassimeres	1,160	11-3	33	35	253.3	8	oz.	3.25 run.
Cassimeres	1,020	9½-3	28	36	253.3	9	oz.	2.50 run.
Cassimeres	1,940	8½-3	28	36	253.3	10	oz.	2.00 run.
Worsteds	1,920	10-6	60	32	253.3	6	oz.	21 wor.
Worsteds	1,440	15-3	45	32	253.3	8	oz.	No. 12 mer.
Worsteds	1,300	13½-3	40	32	253.3	9	oz.	9 xcar.
Tweeds	1,160	11¼-3	34	34½	253.3	7	oz.	3.70 run.
Tweeds	1,040	10¼-3	30	34	253.3	8	oz.	2.90 run.
Tweeds	920	9-3	27	34	253.3	9	oz.	2.25 run.
Tweeds	810	8-3	24	34	253.3	10	oz.	1.80 run.
Cheviots	920	9¼-3	28	33¾	253.3	8	oz.	2.50 run.
Cheviots	820	8¼-3	24	33	253.3	9	oz.	2.00 run.
Cheviots	720	7¼-3	22	33¾	253.3	10	oz.	1.50 run.
Cheviots	600	6-3	18	33	253.3	12	oz.	1.10 run.
Dress fabrics	730	11½-2	23	33	253.3	4	oz.	4.20 run.
Dress fabrics	650	10¼-2	20	32	253.3	4½	oz.	3.35 run.
Dress fabrics	590	9¼-2	18	32	253.3	5	oz.	2.75 run.
Dress fabrics	490	7¾-2	15	32	253.3	6	oz.	1.90 run.

	Thds.	Reed.	P'ks.	Wth.	Weave.	Weight.	Warp	Filling
Unions	1,620	15-3	45	36	253.3	8 oz.	No. 14 cott.	5.25 run.
Unions	1,530	14-3	42	36	253.3	9 oz.	No. 13 cott.	2.50 run.
Unions	1,420	13-3	39	36½	253.3	9 oz.	No. 13 cott.	2½ run.
Unions	1,200	11-3	33	36½	253.3	10 oz.	No. 10 cott.	1.40 run.
Cotton or silk	2,600	540-6	90	29	253.3	12 oz.	No. 28 cotton or silk	
Cotton or silk	2,100	435-6	72	29	253.3	4 oz.	No. 18 cotton or silk	
Cotton or silk	1,740	360-6	60	29	253.3	5 oz.	No. 12 cotton or silk	
Cassimeres	1,440	10-1	40	36	4, 5, 6, 41,	6 oz.	4.00 run.	
Cassimeres	1,260	8¾-4	35	36	42, 43, 44,	8 oz.	3.15 run.	
Cassimeres	1,160	8-4	32	32	52, 53, 54,	9 oz.	2.50 run.	
Worsteds	2,350	18½-4	74	32	55, 56, 57,	10 oz.	No. 26 wor.	
Worsteds	2,040	16-4	64	32	and 79.	6 oz.	No. 15 wor.	
Worsteds	1,780	13¾-4	55	32	warpings	7 oz.	No. 12 wor.	
Worsteds	1,570	12¼-4	49	32	and weavings	8 oz.		
Tweeds	1,280	9¼-4	37	34½	particulars	8 oz.	3.50 run.	
Tweeds	1,100	8-4	32	34½	are the	9 oz.	2.50 run.	
Tweeds	1,020	7½-4	30	34½	same for	10 oz.	2.25 run.	
Tweeds	940	7-4	27	34	all the	11 oz.	1.90 run.	
Cheviots	1,140	8½-1	33	33½	above weaves	8 oz.	3.00 run.	
Cheviots	980	7¾-4	29	34	also below	9 oz.	2.40 run.	
Cheviots	900	9-3	22	33½	23, 24, 25,	10 oz.	2.00 run.	
Cheviots	740	11-2	22	33½	26, 27, 256,	12 oz.	1.40 run.	
Dress fabrics	891	14-2	28	32	257, 184, 185	4 oz.	5.00 run.	
Dress fabrics	790	12¼-2	24	32	186, 197, 191.	4½ oz.	4.00 run.	

Fabric		11-2 / 10-2	22 / 20	32 / 32		5 / 5½	oz. / oz.	Warp	Filling
Dress fabrics	710	11-2	22	32	167, 81, 88, 89.	5	oz.	3.25 run.	
Dress fabrics	640	10-2	20	32		5½	oz.	2.65 run.	
Unions	2,160	15-4	60	36		6	oz.	No. 18 cott.	7 run
Unions	1,860	13-4	52	35¾		8	oz.	No. 14 cott.	4 run
Unions	1,740	12-4	48	36		9	oz.	No. 13 cott.	3 run
Unions	1,420	9¾-4	39	36		11	oz.	No. 11 cott.	2 run
Cotton or silk	2,560	400-8	88	29	7, 8, 9, 10	5	oz.	No. 22 cotton or silk	
Cotton or silk	2,140	660-4	74	29	34, 35, 36,	6	oz.	No. 15 cotton or silk	
Cotton or silk	1,860	575-4	64	29	78.	7	oz.	No. 11 cotton or silk	
Cassimere	1,610	9-5	45	36½		10	oz.	4.60 cotton.	
Cassimere	1,260	14-⅛ ½	35	36		12	oz.	3.00 run.	
Cassimere	1,100	12-⅛ ½	30	36½		7	oz.	2.00 run.	
Worsteds	2,340	11½-5	72	32	N. R. warping and weaving particulars are the same for all the weaves numbered as above.	8	oz.	No. 21 worsted.	
Worsteds	2,040	13½-5	66	32		9	oz.	No. 17 worsted.	
Worsteds	1,900	11¼-5	56	32			oz.	No. 13 worsted.	
Tweeds	1,460	8¼-5	42	35		8	oz.	4.00 run.	
Tweeds	1,220	13½-½ ½	34	35	Also below	10	oz.	3.15 run.	
Tweeds	1,180	13-⅛ ½	33	35	200, 190, 177,	12	oz.	2.55 run.	
Tweeds	1,000	11¼-½ ½	29	34½	192, 83, 90,		oz.	1.80 run.	
Cheviots	1,300	7½-6	38	34½	91, 96, 97,	8	oz.	3.50 run.	
Cheviots	1,040	6-5	30	34½	98, 99, 100,	10	oz.	2.25 run.	
Cheviots	880	10½-⅛ ½	26	33¾	101.	12	oz.	1.50 run.	
Cheviots	740	9-¼ ½	22	32¼		14	oz.	1.20 run.	
Dress fabrics	1,020	15¾-2	31	32¼		4	oz.	5.75 run.	
Dress fabrics	900	14-2	28	32¼		4½	oz.	4.60 run.	
Dress fabrics	830	13-2	26	32¾		5	oz.	3.80 run.	

	Thds.	Reed.	P'ks.	Wth.	Weave.	Weight.	Size. Warp.	Filling.
	760	12-2	24	32		5½ oz.	3.16 run.	6 run
Dress fabrics......	760	12-2	24	32		5½ oz.	3.16 run.	6 run
Unions	2,320	13-5	65	35¼		7 oz.	No. 18 cott.	
Unions	2,150	12-5	60	36		8 oz.	No. 16 cott.	4.60 run
Unions	1,980	11-5	55	36½		9 oz.	No. 14 cott.	3.60 run
Unions	1,800	10-5	50	36		10 oz.	No. 13 cott.	3.00 run
Cotton or silk...	2,500	620-5	86	29	11, 12, 13, 37,	6 oz.	No. 18 cotton or silk	
Cotton or silk...	2,140	540-5	74	29	38, 39, 40,	7 oz.	No. 13 cotton or silk	
Cotton or silk...	1,860	480-5	64	29	71, 72, 74,	8 oz.	No. 10 cotton or silk	
Cotton or silk...	1,660	430-5	57	29	75, 76, 77.	9 oz.	No. 8 cotton or silk	
Cassimeres	1,820	12¼-4	49	37	Warping and	8 oz.	5.00 run.	
Cassimeres	1,460	13½-3	40	37	weaving par-	10 oz.	3.25 run.	
Cassimeres	1,140	10½-3	32	36	ticulars are	12 oz.	2.25 run.	
Worsteds	2,280	11¾-6	71	32½	the same for	8 oz.	No. 19 wor.	
Worsteds	2,020	10½-6	63	32	all the above	9 oz.	No. 15 wor.	
Tweeds	1,440	13¾-3	41	35	weaves.	9 oz.	No. 12 wor.	
Tweeds	1,300	12¾-3	34	35	Also below	10 oz.	3.50 run.	
Tweeds	1,190	11¼-3	30	35	187, 188, 189,	11 oz.	2.90 run.	
Tweeds	1,060	10-3	28	35	196, 198, 193,	12 oz.	2.40 run.	
Cheviots	1,420	13½-3	40	35	174, 180, 178,	8 oz.	3.80 run.	
Cheviots	1,120	10½-3	32	35½	176, 179, 182,	10 oz.	2.40 run.	
Cheviots	940	9-3	27	35	*196, *169,	12 oz.	1.70 run.	
Cheviots	710	7-3	21	35	*170, *171,	16 oz.	1.00 run.	
Dress fabrics....	1,010	15¼-2	31	32		4½ oz.	5.00 run.	

Fabric	Threads	Reed	Picks	Width	Weight		Warp	Filling	Weaves
Dress fabrics	900	14-2	28	32	5	oz.	4.20 run.	4.00 cott.	*172, *173, 85,
Dress fabrics	820	13-2	26	32	5½	oz.	3.40 run.	3.25 run.	92, 93.
Dress fabrics	760	12-2	24	32	6	oz.	2.90 run.	2.64 run.	All marked *
Unions	2,180	10-6	60	36¾	9	oz.	No. 16 cott.	2.25 run.	are filling
Unions	2,020	9¼-6	56	36¾	10	oz.	No. 14 cott.		backs, the size
Unions	1,880	17-3	52	36¾	11	oz.	No. 12 cott.		of backing used
Unions	1,740	16-3	48	36	12	oz.	No. 10 cott.		must be accord-
Cotton or silk	2,720	540-6	90	30	6	oz.	No. 19 cotton or silk		ing to extra
Cotton or silk	2,340	470-6	78	30	7	oz.	No. 14 cotton or silk		weight wanted
Cotton or silk	2,060	420-6	68	30	8	oz.	No. 11 cotton or silk		14, 15, †16,
Cotton or silk	1,820	380-6	63	30	9	oz.	No. 7 cotton or silk		61, 62, 63,
Cassimeres	1,740	18½-¼ ⅓	47	37	9	oz.	3.40 run.		64, 65, 66,
Cassimeres	1,560	12-¼ ⅓	42	36¾	10	oz.	2.90 run.		73, 86, 87,
Cassimeres	1,420	11-¼ ⅓	38	36¾	8	oz.			94, 95.
Worsteds	2,420	10½-⅓	75	32½	9	oz.	No. 20 wor.		Warping and
Worsteds	2,160	9½-7	67	32½	11	oz.	No. 16 wor.		weaving par-
Worsteds	1,780	15¾-¼ ⅓	55	32½	12	oz.	No. 11 wor.		ticulars are
Worsteds	1,620	14¾-¼ ⅓	50	32½	9	oz.	No. 9 wor.		the same for
Tweeds	1,540	12½-¼ ⅓	44	35½	10	oz.	3.80 run.		all the above
Tweeds	1,380	11¼-¼ ⅓	38	35¼	11	oz.	3.00 run.		weaves.
Tweeds	1,240	10-¼ ⅓	35	35½	12	oz.	2.55 run.		All numbers
Cheviots	1,160	10-¼ ⅓	34	35	10	oz.	1.20 run.		marked †
Cheviots	1,220	9½-¼ ⅓	35	35½	11	oz.	2.65 run.		add 10% to
Cheviots	1,100	9-¼ ⅓	33	35	11	oz.	2.20 run.		threads and
Cheviots	1,020	8-¼ ⅓	29	35	12	oz.	1.80 run.		use yarn
Cheviots	860	7-¼ ⅓	24	35	14	oz.	1.25 run.		10% finer

	Thds.	Reed.	P'ks.	Wth.	Weave.	Weight.	Size.
Dress fabrics......	1,080	11-3	33	32	in warp.	4½ oz.	5.50 run.
Dress fabrics......	980	15½-2	31	32	Don't change	5 oz.	4.50 run.
Dress fabrics......	890	14-2	28	32	picks or size	5½ oz.	3.70 run.
Dress fabrics......	810	12½-2	25	32	of filling.	6 oz.	3.15 run.
							Warp. Filling.
Unions	2,400	9½-7	67	36½	also below	9 oz.	No. 18 cott. 4.30 run
Unions	2,180	17-¼ ⅞	60	36½	175, 181, *194,	10 oz.	No. 16 cott. 3.42 run
Unions	1,990	16-¼ ⅞	55	36		11 oz.	No. 12 cott. 2.90 run
Unions	1,880	15-¼ ⅞	52	36		12 oz.	No. 12 cott. 2.40 run
Cotton or silk ...	2,220	380-7	70	30		8 oz.	No. 12 cotton or silk
Cotton or silk ...	1,960	680-¼ ½	58	30	17, 18, 19, †20,	9 oz.	No. 9 cotton or silk
Cotton or silk ...	1,760	600-¼ ⅞	54	37	†21, †22, 23	10 oz.	No. 7 cotton or silk
Cassimeres ...	1,820	12¼-4	48	37	68, 69, 70,	9 oz.	4.50 run.
Cassimeres ...	1,660	11¼-4	44	37	†80.	10 oz.	3.70 run.
Cassimeres ...	1,520	10¼-4	40	37¼		11 oz.	3.00 run.
Cassimeres ...	1,380	9¼-4	36	37¼		12 oz.	2.50 run.
Worsteds	2,080	16-4	65	32½	Warping	10 oz.	No. 14 wor.
Worsteds	1,920	15-4	60	32	and weaving	11 oz.	No. 11 wor.
Worsteds	1,740	13½-4	54	32¼	particulars	12 oz.	No. 9 wor.
Worsteds	1,480	11½-4	46	32¼	are the	14 oz.	No. 7 wor.
Tweeds	1,640	11¼-4	46	35½	same for	9 oz.	4.00 run.
Tweeds	1,440	10-4	40	36	all the	10 oz.	3.25 run.
Tweeds	1,360	9¼-4	37	36	above weaves.	11 oz.	2.75 run.
Tweeds	1,220	¾-4	34	36	All marked	12 oz.	2.25 run.
Cheviots	1,190	½-4	34	35	† add 10 per cent to those	11 oz.	2.30 run.

					Remarks			Warp.	Filling.
Cheviots	1,080	¾-4	31	95	In warp and use warp yarn 10 p. c. finer. Picks and filling remain as given. Also	12	oz.		1.96 run.
Cheviots	920	6½-4	28	85		14	oz.		1.45 run.
Cheviots	800	11½-2	22	35		14	oz.		1.10 run.
Dress fabrics	1,040	16-2	22	35		5	oz.		4.75 run.
Dress fabrics	960	16-2	20	32		5%	oz.		4.00 run.
Dress fabrics	870	13¾-2	27	22		6	oz.		3.35 run.
Unions	2,520	17½-4	70	36	below 199, *168. Those marked * are filling backs, and the size of backing must be according to weight wanted 129, 130, 131, †82.	9	oz.	No. 20 cott.	4.50 run.
Unions	2,400	16¾-4	67	28½		10	oz.	No. 18 cott.	3.70 run.
Unions	2,220	15¾-4	61	28½		11	oz.	No. 16 cott.	3.00 run.
Unions	2,040	14-4	56	28½		11	oz.	No. 14 cott.	2.50 run.
Cotton or silk	1,380	50-4	52	30		10	oz.	8 cotton or silk	
Cotton or silk	1,700	510-4	57	30		11	oz.	6½ cott. or silk	
Cotton or silk	1,540	460-4	61	30		12	oz.	5½ cott. or silk	
Cassimeres	1,920	11½-1-5¼	52	37		9	oz.		4.75 run.
Cassimeres	1,780	10½-1-5¼	48	37½		11	oz.		3.80 run.
Cassimeres	1,600	9½-1-5¼	43	37½		11	oz.		3.25 run.
Cassimeres	1,440	8½-1-5¼	39	37		12	oz.		2.65 run.
Worsteds	2,380	16-1-5¼	72	†82	Warping particulars are same for all the above weaves.	9	oz.	No. 17 wor.	
Worsteds	2,140	14½-1-5¼	65	33		10	oz.	No. 14 wor.	
Worsteds	1,940	13-1-5¼	58	33		11	oz.	No. 11% wor.	
Worsteds	1,660	11¼-1-5¼	50	33		12	oz.	No. 8 wor.	
Cotton or silk	2,440	650-1-5¼	81	30½		8	oz.	No. 13 cott.	
Cotton or silk	2,160	555-1-5¼	72	30		10	oz.	No. 10½ cott.	
Cotton or silk	1,960	470-1-5¼	65	30		11	oz.	No. 8½ cott.	
Cotton or silk	1,760		58	30			oz.	No. 7 cott.	
Cassimeres	2,000	10½-5	52	38	†32, †33, †84.	9	oz.		5.00 run.

	Thds.	Reed.	P'ks.	Wth.	Weave.	Weight	Size.
Cassimeres	1,800	9½-5	47	38		10 oz.	4.00 run.
Cassimeres	1,620	8½-5	43	38		11 oz.	3.35 run.
Cassimeres	1,520	8-5	40	38		12 oz.	2.80 run.
Worsteds	2,460	15-5	74	32½		9 oz.	No. 18 wor.
Worsteds	2,220	13¾-5	67	33		10 oz.	No. 14½ wor.
Worsteds	2,000	12-5	60	33	45, 46, 47, 48,	11 oz.	No. 12 wor.
Worsteds	1,840	11-5	56	33½	49, 50, 51, 183.	12 oz.	No. 10 wor.
Cotton or silk	2,280	540-5	76	30		9 oz.	No. 11 cott.
Cotton or silk	2,040	470-5	68	30½		10 oz.	No. 9 cott.
Cotton or silk	1,840	440-5	61	30		11 oz.	No. 7 cott.
Cotton or silk	1,700	400-5	56	30		12 oz.	No. 6 cott.
Cassimeres	1,520	10½-4	42	36		9 oz.	3.70 run.
Cassimeres	1,140	8-4	32	36		12 oz.	2.10 run.
Worsteds	2,120	16½-4	66	32		10 oz.	No. 14 wor.
Worsteds	1,700	13¾-4	67	32	58.	8 oz.	No. 11 wor.
Cotton or silk	1,940	600-4	88	29		6 oz.	No. 10 cott.
Cotton or silk	2,560	800-4	44	29		8 oz.	No. 19 cott.
Cassimeres	1,560	11-4	35	35½		8 oz.	4.40 run.
Cassimeres	1,260	8¾-4	60	36		10 oz.	2.80 run.
Worsteds	1,920	15-4	48	32		6 oz.	No. 16 wor.
Worsteds	1,540	12-4	80	32		7 oz.	No. 10 wor.
Cotton or silk	2,320	720-4	68	29	59 and 60.	6 oz.	No. 16 cott.
Cotton or silk	1,980	610-4	46	29		7 oz.	No. 12 cott.
Cassimeres	1,660	11¼-4	46	36		9 oz.	4.10 run.
Cassimeres	1,360	9½-4	50	36		11 oz.	2.70 run.

Worsteds	2,300	9-8	72	32		8	oz.	No. 19 wor.
Worsteds	1,660	13-4	52	32		11	oz.	No. 10 wor.
Cotton or silk	2,100	630-4	70	30		8	oz.	No. 12 cott.
Cotton or silk	1,830	540-4	60	30		9	oz.	No. 9 cott.
Cassimeres	2,220	10¾-6	62	36		10	oz.	5.00 run.
Cassimeres	1,840	12¾-4	51	36	67.	12	oz.	3.40 run.
Worsteds	3,000	15½-6	94	32½		9	oz.	No. 21 wor.
Worsteds	2,460	13¾-6	80	32½		11	oz.	No. 14 wor.
Cotton or silk	2,700	540-6	90	30		9	oz.	No. 13 cott.
Cotton or silk	2,280	450-6	76	30	104, 250.	11	oz.	No. 9 cott.
Cassimeres	1,540	10½-4	42	36½		8	oz.	5.00 run.
Cassimeres	1,220	8½-4	34	36		10	oz.	2.90 run.
Cassimeres	1,120	15½-2	31	36		11	oz.	2.35 run.
Cassimeres	1,020	14-2	28	36½		12	oz.	2.00 run.
Worsteds	1,700	13-4	52	33		9	oz.	No. 13 wor.
Worsteds	1,520	11½-4	46	33		10	oz.	No. 11 wor.
Worsteds	1,400	10½-4	42	33		11	oz.	No. 9 wor.
Worsteds	1,280	9¾-4	38	33		12	oz.	No. 7 wor.
Cotton or silk	2,750	410-8	92	30	107 and 244.	5	oz.	No. 25 cott.
Cotton or silk	2,300	680-4	76	30		6	oz.	No. 17 cott.
Cotton or silk	1,980	595-6	66	30		7	oz.	No. 13 cott.
Cotton or silk	1,720	515-4	57	30		8	oz.	No. 10 cott.
Worsteds	2,900	14½-6	88	33		10	oz.	No. 25 wor.
Worsteds	2,280	11½-8	69	33		6	oz.	No. 16 wor.
Cotton or silk	3,420	510-8	114	30	110.	8	oz.	No. 25 cott.
Cotton or silk	2,600	520-6	87	30		8	oz.	No. 14 cott.
Cotton or silk	3,440	515-8	114	30		8	oz.	No. 20 cott.

	Thds.	Reed.	P'ks.	Wth.	Weave.	Weight.	Size.
Cotton or silk	2,760	415-8	92	30	119, 122,	10 oz.	No. 12 cott.
Cotton or silk	3,700	495-9	123	30		8 oz.	No. 27 cott.
Cotton or silk	2,960	600-6	99	30	131.	10 oz.	No. 14 cott.
Cotton or silk	4,180	625-8	138	30		9 oz.	No. 21 cott.
Cotton or silk	3,350	500-3	112	36¾	113, 116, 260.	11 oz.	No. 14 cott.
Cassimeres	1,760	8-6	48	37		10 oz.	4.12 run.
Cassimeres	1,440	13-3	40	33½		12 oz.	2.90 run.
Worsteds	2,620	13-6	78	33		8 oz.	No. 23 wor.
Worsteds	2,220	11¼-6	68	33		10 oz.	No. 15 wor.
Cotton or silk	3,260	650-6	108	30		6 oz.	No. 24 cott.
Cotton or silk	2,460	495-6	82	30		8 oz.	No. 14 cott.
Cassimeres	2,190	14¾-4	59	37	125, 128, 137,	8 oz.	5.10 run.
Cassimeres	1,820	12¼-4	49	37	152, 247, 263,	12 oz.	3.60 run.
Worsteds	3,040	11½-8	92	33	286, 270, 271.	9 oz.	No. 22 wor.
Worsteds	2,460	9¼-8	74	33½	275.	11 oz.	No. 15 wor.
Cotton or silk	3,500	520-8	116	30		7 oz.	No. 22 cott.
Cotton or silk	3,060	460-8	102	30		8 oz.	No. 17 cott.
Cassimeres	2,520	11¼-8	68	37	134, 140, 143,	11 oz.	5.50 run.
Cassimeres	1,980	9-6	54	36¾	146, 279, 280.	14 oz.	3.30 run.
Worsteds	3,430	17-6	100	33¼		10 oz.	No. 23 wor.
Worsteds	2,900	14¼-5	86	33½		12 oz.	No. 16 wor.
Cotton or silk	3,880	750-6	125	31		8 oz.	No. 22 cott.
Cotton or silk	3,420	660-6	110	31	149.	9 oz.	No. 17 cott.
Cassimeres	2,380	16-4	64	37		14 oz.	3.81 run.
Cassimeres	2,080	14-4	56	37		16 oz.	2.90 run.

						oz.	No. designation
Worsteds	3,360	16-6	98	24		12 oz.	No. 18 wor.
Worsteds	2,800	13½-6	82	33½		14 oz.	No. 14 wor.
Cotton or silk	3,520	500-8	110	31½		10 oz.	No. 16 cott.
Cotton or silk	3,200	450-8	100	33		11 oz.	No. 13 cott.
Cotton or silk	2,940	415-8	62	33	155.	12 oz.	No. 11 cott.
Cassimeres	2,220	10¾-6	54	34½		12 oz.	4.60 run.
Cassimeres	1,980	9-6	54	36½		14 oz.	2.60 run.
Worsteds	3,680	14-3	112	33		9 oz.	No. 30 wor.
Worsteds	2,760	10½-8	84	33	158.	12 oz.	No. 16 wor.
Cassimeres	2,460	14¾-¼ ¾	66	37		12 oz.	5.00 run.
Cassimeres	1,980	9-6	54	36½		10 oz.	3.25 run.
Worsteds	3,080	10¾-9	92	33		12 oz.	No. 19 wor.
Worsteds	2,440	8¾-9	72	33	161.	10 oz.	No. 12 wor.
Cassimeres	2,730	12½-6	75	37		12 oz.	5.75 run.
Cassimeres	2,220	10-8	60	33½		12 oz.	3.70 run.
Worsteds	3,480	13-8	104	33½		10 oz.	No. 21 wor.
Worsteds	2,800	10½-3	84	33½			No. 13 wor.

							Warp.	Filling.
Cassimeres	2,400	17-4	33	36		9 oz.	6.50 run.	3.25 run.
Cassimeres	1,820	12½-4	82	36		12 oz.	3.50 run.	1.75 run.
Worsteds	2,700	10½-8	42	32	163.	9 oz.	No.24wor.	No.12wor.
Worsteds	2,060	16-4	33	36		12 oz.	No.14wor.	No. 7wor.
Cassimeres	1,800	12½-4	34	36		9 oz.	4.72 run.	3.15 run.
Cassimeres	1,360	9½-4	26	36	165.	12 oz.	2.65 run.	1.75 run.
Worsteds	2,040	16-4	42	32		9 oz.	No.17wor.	No.11wor.
Worsteds	1,540	12-4	32	32		12 oz.	No.10wor.	No. 6wor.

	Patt'n	Thds.	Reed	Ps.	Wth	Weave	Weight	Size	Run
Ch'v't dress goods.	2 & 1	1,100	11¼-⅞ 1-1	18	64	201, 205, 206, 210, 240.	8 oz.	2.4-20;	1.2-10 "
"	"	980	10⅞-⅞ 1-1	15	64		9 oz.	2.3-30;	1.1-66 "
"	"	880	9¼-⅞ 1-1	14	64		10 oz.	2.2-75;	1.1-40 "
"	"	800	8¼-⅞ 1-1	12	64		11 oz.	2.2-25;	1.1-12 "
"	"	740	7⅞-⅞ 1-1	11	64		12 oz.	2.2-00;	1.1-00 "
"	& 1	1,420	11⅞-⅞ 1-1	23	64	202, 208, 214, 215.	8 oz.	3.5-00;	1.2-50 "
"	"	1,280	10-⅞ 1-1	20	64		9 oz.	3.4-00;	1.2-00 "
"	"	1,140	9-⅞ 1-1	17	64		10 oz.	3.3-25;	1.1-60 "
"	"	1,020	8-⅞ 1-1	16	64		11 oz.	3.2-60;	1.1-30 "
"	"	940	7⅞-⅞ 1-1	14	64		12 oz.	3.2-25;	1.1-12 "
"	& 1	1,700	15⅝-2-2	26	64	203.	8 oz.	4.5-75;	1.2-87 "
"	"	1,500	14-2-2	24	64		9 oz.	4.4-60;	1.2-30 "
"	"	1,380	13-2-2	21	64		10 oz.	4.3-80;	1.1-90 "
"	"	1,260	12-2-2	20	64		11 oz.	4.3-20;	1.1-60 "
"	"	1,140	10¼-2-2	18	64	204, 209.	12 oz.	4.2-60;	1.1-30 "
"	"	1,220	11⅞-2-2	20	64		8 oz.	4.4-20;	1.2-10 "
"	"	1,080	10¼-2-2	17	64		9 oz.	4.3-40;	1.1-70 "
"	"	880	9¼-2-2	15	64		10 oz.	4.2-70;	1.1-85 "
"	"	880	8¼-2-2	13	64		11 oz.	4.2-25;	1.1-12 "
"	"	820	7⅞-2-2	12	64		12 oz.	4.2-00;	1.1-00 "
"	3 & 1	1,160	9-⅞ 1-1	19	64	207.	8 oz.	3.4-20;	1.2-10 "
"	"	1,040	8-⅞ 1-1	16	64		9 oz.	3.3-30;	1.1-65 "
"	"	940	7-⅞ 1-1	14	64		10 oz.	3.2-75;	1.1-40 "
"	"	840	6¼-⅞ 1-1	13	64		11 oz.	3.2-25;	1.1-12 "
"	"	780	6-⅞ 1-1	12	64		12 oz.	3.2-00;	1.1-00 "

:	5-00		oz.	8	211, 212, 213.	64	14-3	1,780	2 & 2	:
:	4-00		oz.	9		64	12¾-2	1,680	:	:
:	3-25		oz.	10		64	11-2	1,420	:	:
:	2-65		oz.	11		64	10-2	1,280	:	:
:	2-35		oz.	12		64	9¼-2	1,180	:	:
	1,2-10	1,4-20;	oz.	8	215, 217, 220, 221, 223, 225.	64	15¾ 1	980	Fine coarse 1 & 1	:
:	1,1-70	1,3-40;	oz.	9		64	14¾-1	860	filling	:
:	1,1-35	1,2-70;	oz.	10		64	12-1	780	all fine	:
	1,2-10	2,4-20;	oz.	8	226, 227, 228, 218, 219, 222.	64	11½-½ 1-1	1,100	fine coarse 2 & 1	:
:	1,1-40	2,2-75;	oz.	10		64	9¼-½ 1-1	880	filling	:
:	1,1-13	2,3-25;	oz.	11		64	8¼-½ 1-1	800	all fine	:
	1,8-25	1,6-50;	oz.	8	224.	64	12-3	1,620	fine coarse 1 & 1	:
:	1,2-10	1,4-20;	oz.	10		64	9¼-2	1,200	filling	:
:	1,1-50	1,2-00;	oz.	12		64	15½-1	1,000	1 & 1	:
:	8-00		oz.	8	229, 230.	64	8-2	1,020	:	:
:	2-25		oz.	9		64	14-1	900	:	:
:	1-85		oz.	10		64	12½-1	800	:	:
:	1-55		oz.	11	233, 236.	64	11¼-1	740	:	:
:	4-20		oz.	8		64	11¼-2	1,460	:	:
:	3-25		oz.	9		64	10¾-2	1,300	:	:
:	2-75		oz.	10		64	9¼-3	1,180	:	:

Patt'n.	Thds.	Reed.	Ps.	Wth.	Weave	Weight	Size
::	1,060	8¼-2	16	64	12.5	11 oz.	2·25 ::
2 & 2	1,680	12¼-2	24	64		9 oz.	4·00 ::
::	1,680	11-2	22	64		10 oz.	3·25 ::
::	1,280	10-2	20	64		11 oz.	2·65 ::
::	1,180	9¼-2	18	64		12 oz.	2·25 ::

RULES FOR FABRICS,

and Tables of Diameters to Use for Various Fabrics for From Four to Sixteen Ounces

CASSIMERES.

To find the threads, picks, reeds, etc., from diameters given in the various weaves: Multiply the diameter by the harness used, and divide by the harness and interlacers; the answer will be the threads per inch, which multiply by 27; the result will be the total number of threads in warp. Divide these by the width wanted in loom; the answer will be the picks per inch, which, again divided by the number of threads in dent, will give the reed to use.

EXAMPLE.

8 oz. fabric wanted 4-harness twill equals 80
diameter

        4 harness and 2 interlacers equals 6.
                    80 diameter.
                    4 harness
                    ——
Har. and Int. 6 : 320

                    ——
                    53½ threads per inch.
                    27   inches wide fine fabric.

        Inches 36 : 1,440

        In dent 4 | 40 picks.

                    ——
                    10 reed, 4 in dent.

Shrink 10 per cent in length in finishing.
80 diameter equals 4.00 run.
                    4 oz. warp.
                    ——
                    1,600 threads.
                    1,440 threads used
                    ——
                    16.00
                    ——
                    10 per c't shrinkage in loom.

In worsted calculations add 10 per cent to ends given.

EXAMPLE.

8 oz. fabric wanted 4-harness twill equals 90 diameter.

```
            90
             4
            ___
    6 | 360
        ___
        60
        27
        _____
        1,620
         160  equals 10 per cent added.
        _____
Inches  32 | 1,780
         ___
        8 | 86 picks.
           _____
           10¾ reed; 8 in dent.
```

90 diameter equals 5.00 run.

```
                4 oz. warp.
                _____
                2,000 threads.
                1,780 threads used.
                _____
        20.00 | 22.00
               _____
               11 p. c. shrinkage in loom.
```

Only scoured natural length.

N. B. The calculations are not always brought to the lowest fraction but very close to it.

In tweed calculations deduct 6 per cent from ends given.

EXAMPLE.

8 oz. fabric wanted 4-harness twill equals 75 diameter.

```
            75 diameter.
             4
            ___
    6 | 300
        ___
        50
        27
        _____
        1,350
          80  equals 6 per cent or nearly so.
        _____
Inches  35 | 1,270
          _____
In dent 4 | 37 picks.
           ___
           9¼ reed, 4 in dent.
```

Shrink 7 per cent in length in finishing.
75 diameter equals 3.50 run.

                    4 oz. warp.
                    ―――
                    1,400
                    1,270
                    ―――
          14.00 | 13.00
                    ―――

                    9¼ p. c. shrinkage in loom.

In cheviots deduct 12 per cent from threads given.

EXAMPLE.

10 oz. fabric wanted 6-harness twill equals 62 diameter.

          62 diameter.
          6 harness and two interlacers equals 8.
                    ――

    8 | 572
          ―――

          46½
          27
          ―――
          1,256
          150 equals 12 per cent deducted.
          ――――
          1,100

Shrink 5 per cent in length in finishing.
62 diameter equals 2-40 run.

                    5 oz. warp.
                    ―――――
                    1,200 threads
                    1,100
                    ―――――
          12.00 | 100.0
                    ―――――

                    8½ p. c. shrinkage in loom.

In cheviot dress fabrics add 15 per cent to threads given.

8 oz. fabric, 6-4 wanted, plain cloth equals 68 diameter.

          68 diameter (or divide diameter by 2.)
          2 harness and 2 interlacers equals 4.
                    ――

    4 | 136
          ―――

          34
          27 this gives threads for 54 inches.
          ―――
          918
          137 equals 10 per cent added.
          ―――――
    64 | 1,055

          ―――――
          2 | 16½ picks.

                8¼ reed, 2 in dent.

Shrink 5 per cent in length in finishing.

68 diameter equals 2.89 run.

4 oz. warp.

$$\frac{1,156}{1,055}$$

$$1,156 \mid 1010.0$$

8¾ p. c. shrinkage in loom.

In cotton and silk add 6 per cent to threads given.

6 oz. fabric, wanted 5-harness twill equals 123 diameter.

123 diameter.
5 harness and 2 interlacers.

$$7 \mid 615$$

$$\frac{38}{27}$$

$$\frac{2,376}{164}$$ equals 6 per cent added.

2,540

Natural length.

123 diam. equals 18 cot. equals 9.45 run.

3 oz. warp.

$$\frac{2,835}{2,540}$$

$$2,835 \mid 2,950$$

10½ p.c. shrink'e.

In double cloths double the diameter used in single cloths, and find threads, picks, etc., as in single cloths, counting harness and interlacers as if single, i. e., a 4-harness twill double cloth requires 8 harness, but only use 4 and 2 interlacers, and so on, and as double the diameter gives 4 times as fine in yarn the size is not taken from the diameter, but the single cloth yarn is just doubled, i. e., a 4-run in single cloth would be 8-run in double cloth, and so on.

In cassimere double cloths deduct 5 per cent from threads for extra shrinkage, caused by binders.

In worsted double cloths only add 5 per cent to threads, instead of 10, as in single cloths.

In cotton and silk double cloths, just take threads as given:

In double cloth in warp and single cloth in filling, 1 face and 1 back in warp such as satin or crow backs, use the double cloth diameter for warp, and the double cloth size of yarn, and use the single cloth size of yarn in filling, using one-half of picks given.

EXAMPLE.

8 oz. fabric, 3 harness twill face, 6 harness satin back.

144 double cloth diam. for 8 oz. 3 harness twill

```
          144
            3
          ───
    5 | 432
        ───
         86
         27
        ────
      2,322
        116  equals 5 per cent shrinkage.
        ───
36½ | 2,200

      6 | 60  picks 30 used, being ½, 3.25 run fill'n.
          ──
          10 reed, 6 in dent.

  72 single cloth diameter equals 3.24 run.
                      3.24
                         2
                      ────
              warp 6.48 run.
                      4 oz. warp.
                    ─────
                    2,590
                    2,200
                  ─────
          2,590 | 3,900
                  ─────
                    15 p. c. shrink. in loom.
```

Warp back, 2 face and 1 back, take the double cloth and the single cloth diameter of whatever weight wanted (taking the

face weave for the consistency), add the
two together and divide the total by 2,
the answer will be the warp diameter to
use. For filling use the single cloth size
as in 1 face and 1 back, but use 2-3 of
picks given, warp yarns.*

*N. B. The size of warp yarn is found
by multiplying the single cloth yarn by
3 and dividing by 2.

EXAMPLE.

8 oz. fabric, 3 harness twill face, 6 harness
crowback.

  144 double cloth diameter for 8 oz. 3 h. t.
  72 single cloth diameter for 8 oz. 3 h. t.

```
        144
         72
       -----
  2 |  216
       -----
        108 warps diamter to use.
          3 harness and 2 interlacers.
       -----
  5 |  324
       -----
         65
         27
       -----
      1,755
         85 equals 5 per cent shrinkage.
       -----
 36 | 1,670
       -----
    3 |  46 picks, 30 being 2-3 used.
       -----
       15½ reed, 3 in dent.
 72 diameter equals 3.24 run.
                     2
                   -----
                   648
                   324
                   -----
              2 |  972
                   -----
                   4.86 run warp.
                      4 oz. warp.
                   -----
                  1,944
                  1,670
                  -----
        1,944 | 2,740
                  -----
                   14 per c't shrinkage in loom.
```

In doeskins multiply the single cloth diameter by 3 and divide by 2, the answer will be the warp diameter to use. To find the size of warp yarn, multiply the single cloth size by 2, and for the filling multiply the single cloth by 3 and divide by 2. The answer will be the size to use; using ¾ of picks given, add 10 per cent to threads given. Take 4 harness single cloth diameter for 8 harness doeskin, etc.

EXAMPLE.

8 oz. fabric wanted 8-harness doeskin, 80 dia., 80 dia. being 8 oz. diameter for 4-harness twill.

```
          80
           3
          ──
    2 | 240

         120 diameter to use.
           8 harness and 2 interlacers

   10 | 960
         ──
          96
          27
        ─────
       2,600
         260 equals 10 per cent added.

35½ | 2,860 threads.

       8 | 80 picks, 60 picks used being ¾

          10 reed, 8 in dent.

80 diam. equals 4.00 run.
                     2
                   ────
                   8.00 run warp.
                   4.00
                 ────────
              2 | 12.00

                   6.00 filling.

          800
            4 oz. warp.
          ─────
         3,200
         2,860
       ────────
32.00 | 34.00

          10½ per cent shrinkage.
```

Half backs, i. e., 2 face and 1 back warp and filling. Take the diameter of single cloth for face weave, and weight of face wanted; deduct from threads according to the number of binders; the remainder will be the number of threads in face warp, which divided by 2 will give the number of back threads; add the two together which will give the total number of threads in warp; then find pick, reed. etc., as in previous rules. Should one or two ounces extra weight be wanted with cheaper filling, use heavier and inferior stock for back filling; if bound every second face pick deduct 12 per cent; if every fourth, deduct 8 per cent; if every sixth, deduct 4 per cent.

EXAMPLE.

12 oz. fabric wanted 8 oz. face, 4 harness twill cass. 80 diameter.

```
        80
         4
       ―――
6 | 320
       ―――
      53½
      27
       ―――
     1,440
       130 equals 8 p. c. for binders, 1 every
       ―――      fourth face pick.
     1,310 face thread.
       655 back thread.
36½ | 1,965 total threads in warp.
     ―――
  6 | 54 picks.
     ―――
         9 reed, 6 in dent.
```

Filling back; take the single cloth diameter for whatever weight and weave wanted, deduct for binders as in half back, add half as many more picks and

put back filling, according to weight wanted; if bound every fourth, deduct 16 per cent; if every sixth, deduct 12 per cent; every eighth, 8 per cent; every tenth, 6 per cent; every twelfth, 4 per cent; every sixteenth, 2 per cent.

EXAMPLE.

12 oz. fabric wanted, 8 oz. face, 6 harness twill, 90 diameter.

90 dia. for 8 oz. 6 harness twill (2 face and 1 back pick).

        6
      ——
  8 | 540
      ——
      67½
      27
      ——

      1,820
        74 equals 4 per cent for binders 1 in 12.
    —————

36½ | 1746 threads in warp.

    4 | 48 picks, one half added equals 72 picks.
      ——

      12 reed, 4 in dent.

Filling 2 of 90 diameter equals 5 run, 1 of 2½ run back filling being just one-half size of face, thus giving 4 oz.

Half back; where this class of goods is wanted, 6 oz. face and 6 oz. back, or any weight being one-half of weight on face, and one-half on back, so as to have one-half of inferior stock of back, take the diameter of the face weight and weave wanted, and the diameter of the back weight and weave wanted, as 12 oz. fabric wanted 4 harness twill face, plain back, take the 6 oz. twill and the 6 oz. plain diameter, add the two together, which after deducting for binders as in the other

one-half back will give the threads **2**
face and 1 back warp and filling.

N. B. All calculations are based on
clean yarns.

EXAMPLE.

12 oz. fabric wanted 6 oz. face, 4 harness
twill, 6 oz. back, plain cloth.

    107 diameter for 6 oz. 4 harness twill.
      4
      —
6 | 428
     —.
      71
      27
    ——
   1,920 face threads.
   1,080 back threads.
   ——
   3,000
    250 equals 8 per cent shrinkage for binders.
   ——
   2,750 total threads in warp.

2 | 80 diameter for 6 oz. plain cloth.
  —
  40
  27
——
1,080
107 warp face diameter equals 7.15 run.
 80 warp back diameter equals 4.00 run.
  Filling the same.

UNIONS.

When making cotton warp fabrics or
others where the warp and filling are
different sizes find the mean size of the
two combined (as shown in rule to find
weave size of two or more sizes laid or
twisted together), multiply said size by
weight of fabric wanted; the answer after
deducting 5 per cent for shrinkage will be
the number of threads in warp, from
which find picks, reed, etc., as usual.

EXAMPLE.

8 oz. fabric wanted 4 harness twill, No. 16
cotton warp, 3-run filling.

No. 16 cotton equals 8.40 run.
Say 8 divided by 8 equals 1
    8 divided by 3 equals 2 2-3

$$\begin{array}{r} 3.66 \enspace | \enspace 800 \end{array}$$

3.20 r. mean size.
    8 oz. fabric.

1,760
  88

$$36\tfrac{1}{4} \enspace | \enspace 1,672 \text{ th'ds in w'p.}$$

4 | 46 picks.

11½ reed, 4 in d't.

Cotton, 8 run | 1,672

2.09 oz. warp.
5.57 oz. filling.

7.66 oz. total.
  .38 equals 5 p. c. loom sh'kage.

8.04 oz. fabric
Run 3 | 1,672

5.57 os. fill.

In cotton warp, as there is no shrinkage in fulling, add 10 per cent to picks for loss in finishing. N. B. All calculations are on a clean yarn basis.

MELTONS AND FLEECED FABRICS.

Multiply size of yarn to be used by one-half of weight wanted, deduct 10 per cent, the answer will be the threads in warp. Next find the diameter of the yarn, which multiply by the harness to be used, and divide by the interlacers; the answer will be the threads which will lie in one inch in that weave. Divide the threads in warp by the threads per inch, given; the answer will be the width to finish for perfect fabric, from which subtract 54, the finished width wanted; the answer will show the amount of felting.

To set it in loom, deduct 20 per cent from the threads per inch, and divide the threads in warp with the remainder; the answer will be the width to set in loom.

EXAMPLE.

24 oz. melton wanted 3.00 run yarn equals 76 diameter.

```
    300        4 harness twill.       70
     12 oz. warp.                      4
   ____                              ____
   3,600                         6 | 280
     360                            ____
   ____                            47 thds. per
17 | 3,240                            inch.
```

```
      69 in. finished for perfect fabric.
      54 in. finished for felted fabric.
      ____
      15 in. felted in finishing.
      47
       8 equals 20 per cent deducted.
      ____
```

Picks, 39 | 3,240

```
           80½ inches in loom.
```

Where two sizes are used, find the mean size, and multiply by total weight wanted, then follow rule given above.

In finding weight of fabric from one or more square inches, multiply width of fabric by weight of one square inch in grains, and divide by 12.15, the answer will be weight per yard.

EXAMPLE.

1 sq. inch weighs 4 grains, 27 inches wide.
```
                      4
                 _____
           12.15 | 10,800
```
```
                 8.80 oz. per yard.
```
Cutting measures 3½ times 3 inches weighs 42 grains.
```
10.50 | 4,200              3.50
                            3
     4 grains per sq. inch. ____
                           10.50 square inches.
```

To find size of warp and filling to make foregoing fabric, find the threads per inch in warp, which multiplied by 27 will give the threads in warp, which divided by half of the weight wanted, will give the size of yarn to use, only have it 7 or 10 per cent heavier for loss in finishing. Multiply picks by 27 and divide by one-half of weight, which will give size of filling.

EXAMPLE.

50 threads per inch warp.
27
———
Ounces 4.44 | 1,350 threads in warp.

3.04 run.
.30 equals 10 per cent for loss.
———
2.74 equals 2¾ run warp.
48 picks.
27
———
Ounces 4.44 | 1,296

292 run.
29 equals 10 per cent loss.
———
2.63 run filling.

INTERLACERS.

In finding interlacers, note the changes that occur in each bar of the chain and in each harness; if it is an even weave one bar will show the number, but if it is an uneven or broken weave note the changes all through both warp and filling way, add them all altogether and divide by the number of harness and bars in chain added; thus a 4, 6, 8 or 12 harness twill 45 degrees only has two changes in each bar, or a 5, 7, 9, 11 or 13 harness corkscrew only two changes in each bar, and so on, but a twill of 27 degrees takes 4 harness and 8 bars, and changes twice every harness, and only twice every other bar, thus it is 4 harness and 8 interlacers, and 8 bars and 8 interlacers, which makes 16 interlacers, which divided by 8 bars and 4 harness equals 12, gives 1 1-3 interlacers in 6 harness.

Thus 4 harness.
8 bars.
—
2 | 12
—   6 harness and 1½ interlacers.
3
— 18 harness and 4 interlacers.

45 degrees is the regular twill moving one point both warp and filling each time.
27 degrees moves 1 point warp way, and 2 points filling way.
63 degrees moves 1 point filling way and 2 points warp way.
70 degrees moves 1 point filling way and 3 points warp way.

TABLES FOR DIFFERENT WEIGHTS AND WEAVES

CASSIMERES.

Oz.	Weave.	Dia.	Oz.	Weave.	Dia.
4	Plain cloth.	120	6	5 har. twill.	115
5	"	96	7		96
6	"	80	8		86
7	"	69	9		76
8	"	60	10		69
9	"	53	11		63
10	"	48	12		57
11	"	44	6	6 har. twill.	120
12	"	40	7		103
5	3 har. twill.	115	8		90
6		96	9		80
7		82	10		72
8		72	11		65
9		64	12		60
10		58	7	7 har. twill	106
11		52	8		93
12		48	9		83
6	4 har. twill.	107	10		74
7		91	11		68
8		80	12		62
9		71	7	8 har. twill	110
10		64	8		96
11		58	9		85
12		53	10		77
			11		70
			12		64

WORSTEDS.

Oz.	Weave.	Dia.	Oz.	Weave.	Dia.
4	Plain cloth.	136	5	5 har. twill.	154
5		109	6		128
6		91	7		110
7		78	8		96
8		68	9		85
9		60	10		77
10		54	11		70
11		49	12		64
12		45	6	6 har. twill.	136
4	3 har. twill.	162	7		117
5		130	8		102

WORSTEDS.

Oz.	Weave.	Dia.	Oz.	Weave.	Dia.
6		108	9		90
7		93	10		81
8		81	11		74
9		72	12		68
10		65	7	7 har. twill.	120
11		59	8		105
12		54	9		93
5	4 har. twill.	144	10		84
6		120	11		76
7		108	12		70
8		99	8	8 har. twill.	108
9		90	9		96
10		72	10		86
11		65	11		79
12		60	12		72

TWEEDS.

Oz.	Weave.	Dia.	Oz.	Weave.	Dia.
6	Plain cloth.	75	6	6 har. twill.	112
7		64	7		97
8		56	8		85
9		50	9		75
10		45	10		68
11		41	11		62
12		38	12		56
7	3 har. twill.	77	6	7 har. twill.	117
8		68	7		100
9		60	8		88
10		54	9		78
11		48	10		70
12		45	11		64
7	4 har. twill.	86	12		59
8		75	6	8 har. twill.	120
9		64	7		108
10		60	8		90
11		55	9		80
12		50	10		72
7	5 har. twill.	92	11		66
8		80	12		60
9		71			
10		64			
11		58			
12		54			

CHEVIOTS.

Oz.	Weave.	Dia.	Oz.	Weave.	Dia.
6	Plain cloth.	70	6	5 har. twill.	100
7		60	7		86
8		52	8		75
9		46	9		67
10		42	10		60
11		38	11		55
12		35	12		50
4	3 har. twill.	126	7	6 har. twill.	89
5		101	8		78
6		84	9		69
7		72	10		62
8		63	11		57
9		56	12		52
10		50	7	7 har. twill.	92
11		46	8		81
12		42	9		72
4	4 har. twill.	140	10		65
5		112	11		59
6		93	12		54
7		80	7	8 har. twill.	96
8		70	8		84
9		62	9		75
10		56	10		67
11		51	11		61
12		47	12		56
14		40	14		48

TWEED DRESS GOODS 6-4.

Oz.	Weave.	Dia.	Oz.	Weave.	Dia.
8	Plain cloth.	68	8	7 har. twill.	106
9		60	9		94
10		54	10		85
11		50	11		77
12		45	12		71
8	3 har. twill.	82	8	8 har. twill.	109
9		73	9		97
10		66	10		87
11		60	11		80
12		55	12		78
8	4 har. twill.	98			
9		80			
10		72			
11		65			
12		60			

TWEED DRESS GOODS—6-4.

Oz.	Weave.	Dia.	Oz.	Weave.	Dia.
8	5 har. twill.	96			
9		86			
10		78			
11		71			
12		65			
8	6 har. twill.	102			
9		91			
10		82			
11		74			
12		68			

COTTON OR SILK.

Oz.	Weave.	Dia.	Oz.	Weave.	Dia.
4	Plain cloth.	128	5	6 har. twill.	154
5		102	6		128
6		85	7		110
7		73	8		96
8		64	9		85
9		57	10		77
10		51	6	7 har. twill.	133
4	3 har. twill.	170	7		114
5		136	8		100
6		113	9		89
7		97	10		80
8		85	11		73
9		77	12		67
10		68	6	8 har. twill.	136
4	4 har. twill.	184	7		117
5		147	8		102
6		123	9		91
7		105	10		82
8		92	11		74
9		82	12		68
10		74	8	9 har. twill.	105
5	5 har. twill.	147	9		93
6		123	10		84
7		105	11		76
8		92	12		70
9		82	14		60

DOUBLE CLOTH CASSIMERES.

Oz.	Weave	Dia.	Run.	Oz.	Weave	Dia.	Run.
6	Double plain. See rule for double cloths.	160	8.00	9	5 harness twill double cloth.	153	7.75
7		137	6.00	10		138	6.00
8		120	4.50	11		125	5.00
9		107	3.60	12		115	4.10
10		98	2.85	14		98	3.00
11		87	2.00	16		86	2.30
12		80	2.00	8	6 harness twill double cloth.	180	10.00
7	8 harness cloth.	164	8.40	9		160	8.00
8		144	6.50	10		144	6.50
9		128	5.10	11		131	5.50
10		115	4.10	12		129	4.50
11		105	3.50	14		103	3.30
12		98	2.75	16		90	2.50
13		83	2.10				
14		72	2.10				
8	4 harness twill double cloth.	160	1.60				
9		142	3.00				
10		128	6.25				
11		116	5.10				
12		107	4.20				
14		91	3.00				
16		90	2.00				

DOUBLE CLOTH WORSTEDS.

Oz.	Weave.	Dia.	Wor. No.	Oz.	Weave.	Dia.	Wor. No.
6	Double plain.	180	No. 28	8	5 harness twill double cloth.	192	No. 32
7		156	No. 21	9		170	No. 26
8		136	No. 17	10		154	No. 21
9		120	No. 13	11		140	No. 18
10		108	No. 10	12		128	No. 15
11		98	No. 9	14		110	No. 10
12		90	No. 7	16		96	No. 9
6	3 harness twill double cloth.	216	No. 42	8	6 harness twill double cloth.	204	No. 37
7		186	No. 29	9		180	No. 28
8		162	No. 23	10		162	No. 23
9		144	No. 19	11		148	No. 20
10		130	No. 15	12		136	No. 17
11		118	No. 12	14		116	No. 12
12		108	No. 10	16		102	No. 9
6	4 harness twill double cloth.	240	No. 50	8	8 harness twill double cloth.	216	No. 42
7		206	No. 38	9		192	No. 32
8		180	No. 28	10		172	No. 26
9		160	No. 22	11		158	No. 22
10		144	No. 19	12		144	No. 19
11		130	No. 15	14		124	No. 14
12		120	No. 13	16		108	No. 10

See double cloth rules. Have not used fractions in worsted numbers, but taken the nearest whole number.

DOUBLE CLOTH FOR COTTON OR SILK.

Oz.	Weave	Dia.	Cotton No.	Oz.	Weave	Dia.	Cotton No.
4	Double plain. See double cloth rule.	256	No. 38	6	5 harness twill double cloth.	246	No. 36
5		204	No. 25	7		210	No. 28
6		170	No. 17	8		184	No. 20
7		146	No. 13	9		164	No. 16
8		128	No. 10	10		148	No. 13
9		114	No. 8	11		134	No. 11
10		102	No. 6	6	6 harness twill double cloth.	256	No. 38
5	3 harness twill double cloth.	246	No. 36	7		220	No. 28
6		202	No. 24	8		192	No. 22
7		174	No. 18	9		170	No. 17
8		152	No. 14	10		154	No. 14
9		136	No. 11	11		140	No. 12
10		122	No. 9	12		128	No. 10
6	4 harness twill double cloth.	228	No. 30	8	8 harness twill double cloth.	204	No. 25
7		194	No. 22	9		182	No. 20
8		170	No. 17	10		164	No. 16
9		154	No. 14	11		148	No. 13
10		136	No. 11	12		136	No. 11
11		124	No. 9	14		117	No. 8
				16		102	No. 6

Have not used fractions in cotton numbers but taken the nearest whole number.

WARP, DOUBLE CLOTH, SINGLE CLOTH IN FILLING.
Cassimere.

Oz.	Weave	Diam.	W'rp run.	Fill. r'n.
6	Warp back.	160	8.00	4.00
7	Plain cloth.	137	6.00	3.00
8		120	4.50	2.25
9		107	3.60	1.80
10		96	2.85	1.42
11		87	2.35	1.18
12		80	2.00	1.00
7	3 harness	164	8.40	4.20
8	twill.	144	6.50	3.25
9		128	5.10	2.55
10		115	4.10	2.05
11		105	3.50	1.75
12		96	2.85	1.42
14		82	2.10	1.05
16		72	1.60	0.80
8	4 harness	160	8.00	4.00
9	twill.	142	6.25	3.12
10		128	5.10	2.55
11		116	4.20	2.10
12		107	3.60	1.80
14		91	2.60	1.30

Oz.	Weave	Diam.	W'rp run.	Fill. r'n.
8	5 harness	80	2.00	1.00
9	twill.	153	7.25	3.62
10		138	6.00	3.00
11		125	5.00	2.50
12		115	4.10	2.05
14		98	3.00	1.50
16		86	2.30	1.15
8	6 harness	180	10.00	5.00
9	twill.	160	8.00	4.00
10		144	6.50	3.25
11		131	5.50	2.75
12		120	4.50	2.25
14		103	3.30	1.65
16		90	2.50	1.25
8	8 harness	192	11.50	5.75
9	twill.	170	9.20	4.60
10		154	7.40	3.70
11		140	6.10	3.05
12		128	5.10	2.55
14		110	3.75	1.88
16		96	2.85	1.42

Either have back and face warp same weave or bind back to face as required.

WARP, DOUBLE CLOTH, SINGLE CLOTH FILLING.
WORSTEDS.

Oz.	Weave.	Dia.	Warp.	Filling.	Oz.	Weave.	Dia.	Warp.	Filling.
6	Plain cloth.	180	No. 29 wor.	No. 14 wor.	8	Double cloth.	192	No. 33 wor.	No. 17 wor.
7	Double warp.	156	No. 22 wor.	No. 11 wor.	9	5 har. twill.	170	No. 26 wor.	No. 13 wor.
8		136	No. 16 wor.	No. 8 wor.	10		154	No. 21 wor.	No. 11 wor.
9		120	No. 13 wor.	No. 7 wor.	11		140	No. 12 wor.	No. 9 wor.
10		108	No. 10 wor.	No. 5 wor.	12		128	No. 15 wor.	No. 8 wor.
11		98	No. 8 wor.	No. 4 wor.	14		110	No. 11 wor.	No. 6 wor.
12		90	No. 7 wor.	No. 3 wor.	16		96	No. 8 wor.	No. 4 wor.
6	Double warp.	216	No. 42 wor.	No. 21 wor.	8	Double cloth.	204	No. 37 wor.	No. 19 wor.
7	3 har. twill.	186	No. 29 wor.	No. 15 wor.	9	6 har. twill.	180	No. 29 wor.	No. 13 wor.
8		162	No. 23 wor.	No. 12 wor.	10		162	No. 23 wor.	No. 12 wor.
9		144	No. 19 wor.	No. 10 wor.	11		148	No. 20 wor.	No. 10 wor.
10		130	No. 15 wor.	No. 8 wor.	12		136	No. 17 wor.	No. 9 wor.
11		118	No. 12 wor.	No. 6 wor.	14		116	No. 12 wor.	No. 6 wor.
12		108	No. 10 wor.	No. 5 wor.	16		102	No. 9 wor.	No. 5 wor.
6	Double warp.	240	No. 51 wor.	No. 26 wor.	8	Double cloth.	216	No. 42 wor.	No. 21 wor.
7	4 har. twill.	206	No. 38 wor.	No. 19 wor.	9	8 har. twill.	192	No. 28 wor.	No. 17 wor.
8		180	No. 29 wor.	No. 15 wor.	10		172	No. 28 wor.	No. 13 wor.
9		160	No. 22 wor.	No. 11 wor.	11		158	No. 22 wor.	No. 11 wor.
10		144	No. 19 wor.	No. 10 wor.	12		144	No. 19 wor.	No. 10 wor.
11		130	No. 15 wor.	No. 8 wor.	14		124	No. 14 wor.	No. 7 wor.
12		120	No. 13 wor.	No. 7 wor.	16		108	No. 10 wor.	No. 5 wor.

WARP, HALF BACK, SINGLE CLOTH IN FILLING.
Cassimeres.

Oz.	Weave.	Diam.	W'rp run.	Fill. r'n.	Oz.	Weave.	Diam.	W'rp run.	Fill. r'n.
8	Plain cl'th.	90	3.40	2.25	9	6 har. twill. ½ back.	135	7.50	5.00
9	2 face and 1.	82	2.65	1.78	9		120	6.00	4.00
10	Back warp.	72	2.20	1.45	10		108	4.90	3.25
11		66	1.80	1.20	11		98	4.00	2.65
12		60	1.50	1.00	12		85	3.00	2.00
8	3 har. twill. ½ back. warp.	108	4.99	3.25	14		76	2.40	1.60
9		98	2.85	2.56	16		68	1.90	1.25
10		87	3.15	2.10	8	7 har. twill. ½ back.	140	8.10	5.40
11		78	2.55	1.70	9		124	6.45	4.30
12		72	2.20	1.45	10		111	5.10	2.90
8	4 har. twill. ½ back.	130	6.00	4.00	11		102	4.35	2.40
9		108	4.75	3.15	12		93	3.60	1.75
10		98	3.85	2.56	14		80	2.65	1.25
11		87	3.15	2.10	16		70	1.88	1.25
12		79	2.60	1.75	8	8 har. twill. ½ back.	144	8.60	5.75
8	5 har. twill. ½ back.	129	6.90	4.60	9		128	7.00	4.65
9		114	5.40	3.60	10		116	5.55	3.70
10		104	4.60	3.00	11		106	4.60	3.05
11		95	3.70	2.50	12		98	3.85	2.56
12		85	3.00	2.00	14		83	2.85	1.90
					16		72	2.20	1.45

Bind back to face according to weave. See rule for above.

WARP, HALF BACK, SINGLE CLOTH IN FILLING WORSTEDS.

oz.	Weave.	Dia.	Warp.	Filling.
6	Plain cloth. ½ back warp.	136	No. 23 wor.	No. 15 wor.
7		117	No. 16 wor.	No. 11 wor.
8		102	No. 12 wor.	No. 8 wor.
9		90	No. 10 wor.	No. 7 wor.
10		80	No. 8 wor.	No. 4 wor.
11		75	No. 6 wor.	No. 8 wor.
12		67	No. 6 wor.	No. 8 wor.
7	3 har. twill. ½ back warp.	190	No. 24 wor.	No. 16 wor.
8		120	No. 18 wor.	No. 12 wor.
9		108	No. 15 wor.	No. 8 wor.
10		97	No. 12 wor.	No. 8 wor.
11		90	No. 10 wor.	No. 5 wor.
12		80	No. 8 wor.	No. 7 wor.
8	4 har. twill. ⅜ back warp.	135	No. 23 wor.	No. 12 wor.
9		120	No. 18 wor.	No. 8 wor.
10		108	No. 15 wor.	No. 7 wor.
11		97	No. 12 wor.	No. 8 wor.
12		90	No. 10 wor.	No. 15 wor.
8	5 har. twill. ½ back warp.	144	No. 23 wor.	No. 13 wor.
9		128	No. 20 wor.	No. 11 wor.
10		115	No. 16 wor.	No. 9 wor.
11		106	No. 14 wor.	
12	6 har. twill. ⅜ back warp.	97	No. 12 wor.	No. 8 wor.
8		153	No. 28 wor.	No. 19 wor.
9		144	No. 23 wor.	No. 15 wor.
10		120	No. 18 wor.	No. 12 wor.
11		111	No. 15 wor.	No. 10 wor.
12		102	No. 12 wor.	No. 8 wor.
14		87	No. 9 wor.	No. 6 wor.
16		78	No. 7 wor.	No. 5 wor.
8	7 har. twill. ½ back warp.	157	No. 30 wor.	No. 20 wor.
9		140	No. 23 wor.	No. 16 wor.
9		128	No. 19 wor.	No. 15 wor.
10		114	No. 16 wor.	No. 11 wor.
11		105	No. 14 wor.	No. 9 wor.
12		90	No. 10 wor.	No. 7 wor.
14		78	No. 7 wor.	No. 5 wor.
8	8 har. twill. ¼ back warp.	162	No. 32 wor.	No. 21 wor.
9		144	No. 23 wor.	No. 15 wor.
10		128	No. 20 wor.	No. 13 wor.
11		120	No. 18 wor.	No. 10 wor.
12		108	No. 15 wor.	No. 7 wor.
14		93	No. 11 wor.	No. 10 wor.
16		80	No. 8 wor.	No. 5 wor.

CHAPTER V.

Instructions and Suggestions Pertaining

to Various Fabrics and Yarns.

BINDING TWO OR MORE FABRICS.

When binding a double cloth or half back, raise one of the back warp threads when a face thread is up on each side of it, i. e., between two face risers when a face pick is going in, so that the face warp threads may cover the binder.

In 3-ply, raise a back warp thread between two middle risers when middle pick is going in, and a middle warp thread between 2-face risers when a face pick is going in; should you, "owing to the weave," not be able to have a riser on each side, have at least one, although it will show an imperfection without two or more.

When putting on a filling back, drop one of your warp threads or rather leave one down, which was already down when the back pick goes in, and if possible, it should remain down for the next face, i. e., it should remain down for at least three picks, the middle pick being the backing.

CUTTING.

When making diapers or herring bones always have a clean cut where the twill is reversed, i. e., have risers opposite sinkers; same in combination weaves; if not clean cut they look and are imperfect.

WIDTHS TO SET WARPS IN LOOM.

Worsteds with worsted filling,	31 to 33 "
Worsteds with cotton filling,	29 to 31 "
Worsteds with wool filling,	32 to 34 "
All wool cassimeres,	36 to 38 "
Wool and shoddy cassimeres,	35 to 37 "
Wool and shoddy and cott. cassimeres,	34 to 36 "
Tweeds, all wool,	34 to 36 "
Cheviots, all wool,	33 to 35 "
Cheviots, wool and shoddy,	33 to 34 "
Dress goods, 6-4,	62 to 65 "
Unions,	34 to 37 "
Cotton,	28 to 30 "

It is difficult to give exact rules as to setting warp in reeds, as the stock and the weaves vary so, and the state of the market often demands changes. Some seasons a slazy fabric is in demand when less felting is required, and therefore they

don't require to be set wide in loom;
other seasons the reverse is the case, but,
as a general thing, the above widths will
be found satisfactory.

TABLE OF YARN RATES.

Basis of rates in the following tables:

1 run woolen (U. S.) equals 1,600 yards per lb.
  of 16 oz.
1 cut woolen (U. S.) equals 300 yards per lb.
  of 16 oz.
1 cut woolen (Scotch) equals 300 yards per lb.
  of 24 oz.
1 skein woolen (Yorkshire) equals 256 yards per
  lb. of 16 oz.
No. 1 worsted equals 560 yards per lb. of 16 oz.
No. 1 cotton equals 840 yards per lb. of 16 oz.
No. 1 silk equals 840 yards per lb. of 16 oz.
No. 1 linen equals 300 yards per lb. of 16 oz.

TABLE NO. 1.

To bring worsted numbers to woolens runs
  multiply by 7 and divide by 20.
To bring worsted numbers to cotton numbers
  multiply by 2 and divide by 3.
To bring worsted numbers to cuts (United
  States), multiply by 28 and divide by 15.
To bring worsted numbers to cuts (Scotch),
  multiply by 14 and divide by 5.
To bring worsted numbers to skeins (York-
  shire), multiply by 35 and divide by 16.

Silk is the same as cotton, and linen
same as cuts (United States).

TABLE NO. 2.

To bring woolen runs to worsted numbers,
  multiply by 20 and divide by 7.
To bring woolen runs to cotton numbers, mul-
  tiply by 40 and divide by 21.
To bring woolen runs to cuts (U. S.), multi-
  ply by 16 and divide by 3.
To bring woolen runs to cuts (Scotch), multi-
  ply by 16 and divide by 2.
To bring woolen runs to skeins, multiply by 25
  and divide by 4.

TABLE NO. 3.

To bring cotton numbers to worsted numbers,
  multiply by 3 and divide by 2.
To bring cotton numbers to woolen runs, mul-
  tiply by 21 and divide by 40.
To bring cotton numbers to woolen cuts (United
  States) multiply by 14 and divide by 5.
To bring cotton numbers to woolen cuts
  (Scotch), multiply by 21 and divide by 5.
To bring cotton numbers to skeins, multiply by
  105 and divide by 32.

TABLE NO. 4.

To bring cuts (U. S.) to worsted numbers, multiply by 15 and divide by 28.

To bring cuts (U. S.) to cotton numbers, multiply by 5 and divide by 14.

To bring cuts (U. S.) to woolen runs, multiply by 3 and divide by 16.

To bring cuts (U. S.) to woolen cuts (Scotch), multiply by 3 and divide by 2.

To bring cuts (U. S.) to woolen skeins, multiply by 75 and divide by 64.

TABLE NO. 5.

To bring cuts (Scotch) to worsted numbers, multiply by 10 and divide by 28.

To bring cuts (Scotch) to cotton numbers, multiply by 10 and divide by 42.

To bring cuts (Scotch) to woolen runs, multiply by 2 and divide by 16.

To bring cuts (Scotch) to woolen cuts (U. S.), multiply by 2 and divide by 3.

To bring cuts (Scotch) to woolen skein, multiply by 25 and divide by 32.

TABLE NO. 6.

To bring skeins (York.) to worsted numbers, multiply by 16 and divide by 35.

To bring skeins (York.) to cotton numbers, multiply by 32 and divide by 105.

To bring skeins (York.) to woolen runs, multiply by 4 and divide by 25.

To bring skeins (York.) to cuts (U. S.), multiply by 64 and divide by 75.

To bring skeins (York.) to cuts (Scotch), multiply by 32 and divide by 25.

SIZE OF YARNS WHEN TWO OR MORE ARE LAID TOGETHER.

Rule to find the mean size of yarn when two or more are laid together:

Divide the highest number by itself, and by all the others, then by the different answers added, the answer will be the mean size.

EXAMPLE.

1 thread of 8 run; 8 ÷ 8   1
1 thread of 4 run; 8 ÷ 4=2
1 thread of 2 run; 8 ÷ 2=4

$$\overline{7\ |\ 8}$$

1 1-7 run, mean size.

SHRINKAGE AND SIZE OF YARNS WHEN TWISTED TOGETHER.

To find shrinkage and size when twisted together, knowing the size of each of the

single yarns before twisting. Find the yards per oz. after twisting, which multiply by 16 to bring to lbs., and divide the answer by the size of each of the single threads separately; the result will be the number of oz. of each if laid straight; add them all together and substract from 16, i. e., one lb., the answer will show the shrinkage, by adding two ciphers to said answer and dividing by 16 the percentage will be found which being added to the yarn will give the amount of single required for one lb. of twist.

EXAMPLE.

The above three threads after being twisted give 88 yards.

Per oz. 88
        16 oz.
        ———

Run 8 | 1,408 yards per lb.
        ———

        1.76 oz. of 8 run.
Run 4 | 1,408   Run 2 | 1,408

        3.52 oz. of 4 run.   702 oz. of 2 run.
            1,600   352
            1,230   176
            ———   ———
     16 | 3,700   12.30
        ———

            23 per cent shrinkage.
1,600—1,230—1,600
            16
            ———

    1,230 | 25,600
          ———

            2,080 amt. single yarn required for 1
                    lb. twist.

SAMPLE OF RANGE TICKET.

D. MANUFACTURING CO.

Date, Sept. 4, 1895.
Range, 1800.   Picks, 40.   Length, 6 yards.
        Threads, 1,440.   Width, 36.
Weight, ———.   Reed, 10-4.   Weave, A1.

Warp Pattern.		Filling Pattern.	
101	4	102	4
118	4	103	4
101, 114		102, 105	
101, 115		102, 105	
101, 116		102, 106	
101, 112		102, 107	
101, 111		102, 108	

EXPLANATION OF RANGE TICKET.

As will be noticed in the range ticke
just given, the colors are represented b;
numbers instead of names, as being botl
a saving of space and labor; the designe
should have a yarn book with pods of al
his different stocks and colors, with th·
numbers alongside, according to th·
stock, i. e., suppose you have twent>
colors of No. 1 stock. Call your firs
color 101; second, 102; third, 103, and s·
on, doing the same in the other stock·
as No. 2 stock will begin 201, No. 3 stock
301, and so forth so that the first figur·
of each designates the stock, and th·
last figure denotes the color. So in num
bering your ranges ,let the first figur·
represent the stock, and the second fig
ure the weight, as 1,700 will stand fo·
No. 1 stock, 7 ounces; 1,800, No. 1 stock
8 oz., and so on; 2,800 will signify 8 oz
in No. 2 stock; 3,900 shows that the fab
ric is 9 oz., No. 3 stock, etc., the last
figure just being altered ⸱to show the
range number, as 1,800, 1,801, 1,802, etc.
Should you make more than 100 ranges
of the one stock, when you come to the
100 mark as you can't change 1,700 into
1,800 with mixing your 708 oz. ranges
you add another cipher, as 17,001, 17,002.
and so on.

When each range comes out of loom
it should be brought to the design room
at the same time bringing the ticket
which ticket after marking weight out
of loom in place designated for that pur-
pose should be filed, keeping the differen⸱
stocks on separate files if possible; at any
rate arranging them systematically so
that they can be quickly found wher
wanted.

How to find weight out of loom and
length to which to full to get weight
required when finished, find the weight
of range in ounces, which multiplied bv
36 and divided by its length in inches wil.
give the weight per yard.

EXAMPLE.

Range weighs 26 ounces out of loom.
measures 70 inches.

$$26 \text{ oz.}$$
$$36$$
$$\overline{}$$
$$70 \mid 936$$
$$\overline{}$$
$$13 \ 26\text{-}70 \text{ oz. per yard.}$$

To find length to finish, multiply the ounces by 36 as before; deduct, if in grease, 20 per cent for clear finish, and 15 per cent for natural finish; if clean, 10 per cent and 7 per cent, and divide the remainder by weight wanted, the answer will be length to full.

EXAMPLE.

```
      26 oz.
      36
      ---
      936
      186 equals 20 per cent for loss.
                ---
oz. 12 | 750
       ---
       62½ inches finished.

  26 oz.
  36
  ---
  936
  93 equals 10 per cent clean shrinkage.
  ---
oz.
12 | 843
   ---
   70¼ in. finished, being natural length.
```

FINISHING CASSIMERE RANGES.

After being fulled to the required width and length and thoroughly washed, raise on dry gig, i. e., with the range wet the way of the warp, then give it a few up and down runs on a wet gig. "i. e., having a perforated pipe throwing a stream of clear water on the piece" to clean it out. Next extract, then dry and shear; after shearing, run over steam brush, hot press and steam.

FINISHING WORSTED RANGES.

Scour with fine soap, rinse, wash thoroughly first with luke-warm and then cold water, run 30 minutes through 110 degrees of clear water on crabber, gig a little on blunt teasels, dry and give a few more runs on gig, then shear, run over brush, hot press and steam, with wool filling; they may be gigged a little more while wet.

FINISHING LIGHT-WEIGHT
WORSTED CLOAKING RANGES.

Scour as above, extract, crab, roll and steam, dye, speck dye if necessary, wash

and extract; dry gig a little on face and back, burl, shear, brush on back. Press, look over, and steam on brush.

HEAVY-WEIGHT WORSTED CLOAKING RANGES.

Scour, extract, gig a little on face as before and back, according to finish wanted. Crab with face inside; after crabbing, lift on to rolling frame and re-roll tightly, face out cover with several rolls of cotton, tying the cotton tightly at the ends, set the roll upright in steam box and steam it for 15 or 20 minutes, then dye and speck dye, rinse and extract, run a few times over gig, then shear, run over steam brush back down, press face up with steam on, run over steam brush.

TWEED RANGES

should be treated the same as cassimeres, but shear only top instead of shearing close.

CHEVIOT RANGES

should be principally done in the falling stocks if possible.

TWEED DRESS FABRICS

should be run a short while in stock to soften them.

MELTON RANGES.

As a close fine felt is required on those goods, they are laid extra wide in loom, so as to allow for a large amount of fulling (see rule for meltons) after being fulled to the requisite point (sometimes they are fulled in grease, and sometimes scoured, which is preferable first). After being thoroughly scoured and rinsed, which is essential, especially for steam-finished fabrics, extract, then gig all one way with old work on wet gig; after gigging a while extract and crop (not drying), then gig again and crop as before; if necessary, three times, so as to get the required effect; after the last cropping, run a few times over very blunt teasels, then steam and gig alternately until the necessary nap and lustre are attained, then extract and dry, then run over steam brush, then shear and press and steam.

DIAMETERS OF COUNTS OF YARN.

To find the diameters of the various counts of yarns multiply the yards contained in one pound of yarn by its counts. and extract the square root of the product; the answer will be the diameter of the yarn, and show how many threads of that size will lie side by side in one inch.

EXAMPLES.

1 lb. 4 run yarn   =sq. r't   6,400=80 diam.
1 lb. No. 20 cot. y'n=sq. r't 16,800=4.10 dia.
1 lb. No. 16 wor. y'n=sq. r't   8,960=n'ly 95d.
1 lb. No. 28 cut y'n=sq. r't 7,500=86 104-166d

To bring the diameter to runs, multiply the diameter by itself and divide by 16.

To bring diameter to cotton numbers multiply by itself and divide by 840.

To bring diameter to worsted numbers multiply by itself and divide by 560.

To bring diameter to cuts (U. S.) multiply by itself and divide by 300.

To bring diameter to cuts (Scotch) multiply by itself and divide by 450.

To bring diameter to skeins (Yorkshire) multiply by itself and divide by 256.

DIAMETER   FOR   DIFFERENT   NUM-BER OF HARNESS.

To find the diameter for different number of harness and interlacers from any given diameter: Multiply the given diameter by the number of harness and divide by the number of harness and interlacers required, then multiply the answer by the harness and interlacers and divide by the harness of the original diameter, the answer will be the new diameter to use.

EXAMPLE.

Diameter for 6-harness twill wanted: diameter for plain cloth.

```
          60
           6 harness and 2 int.
          —-
    8 | 360
          —-
          45
           4 orig. har. and interlac's.
          ——
orig. h'n's 2 | 180
          —-
          90 new dia. for 6 har. twill.
```

DIAMETER FOR VARIOUS WEIGHTS.

To find different diameters for various weights in same weave: Multiply diameter of the weave used by its own weight and divide by the weight wanted, the answer will be the diameter required.

EXAMPLE.

80 dia. for 8 oz. in 4 har. twill cass.
8 oz.

oz. 7 | 640

91½ diam. for 7 oz.

80
8 oz.

9 | 640

71 dia. for 9 oz.

10 | 640

12 | 640

64 dia. for 10 oz.

53⅓ dia. for 12 oz.

RULES FOR FIGURE WEAVING.

When using the single plain plan 231 on plate, first draw out any figure you want as shown in 232, then beginning at the lower left hand corner of figure go up the first bar and wherever there is a black in figure, put down the 4 squares marked B, and for the white in figure put down the 4 squares marked W, no matter how many black or white, keep repeating on that color until the change; after first bar take the second and do the same until all the figure is done; then reduce your harness (see reducing).

When using the double plain plan 248 for every black in figure take 4 squares of the plan marked B, and for every white 4 of the squares marked W, beginning on first bar of figure with 1 on plan and taking odd and even alternately going upward, but keeping in the black half while on black, and in the white while on white. Should the black or white end on an odd number, be sure and begin with an even on the next color, and if ending on an even begin on an odd; be sure when you are on the odd bars in figure that you keep on odd in plan and vice versa, the first 2 bars of plan being odd and only representing 1 of figure.

Plans 245, 261 and 264 are on the same principle as 248, only in place of taking 4 squares for each one of the figures, take 16 squares for each one.

258 and 238 are on the same principle as 248, only in place of taking only 4 squares, take 9 squares for each one of the figure.

242 is again on the same principle as 248, only take 9 squares and be sure and keep on the colors as marked, i. e., B. R. W. according as they come in your figure, also keep right with your odds and evens.

251 is the same principle as 231, only take 9 squares in place of 4.

254 is the same as '251, only take 16 squares in place of 4.

All the plans are warp and filling pattern one and one with the exception of 251 and 254, which are solid contrasting warp and filling.

REDUCING HARNESS BY CROSS DRAWING.

In reducing harness, as shown in 256 and 257, the one being 24-harness straight draw the other being the same weave but reduced to 12-harness and draw, take the first harness and write it down as in 257, putting 1 alongside for the first thread in draft, then take the second and put it down with the second thread in draft alongside; continue thus until you come to one that is the same as one of those already put down, when instead of writing down again simply put the draft number on the same line as the other thread in the draft, i. e., where one of the same kind has been already marked as shown in 257 where 13 of 256 being the same as 9, the thread in draft is put there, 14 is the same as 10, 15 as 11, 16 as 12, 17 as 5, 18 as 6 and so on as the bars being the same, by putting threads on those harness they must weave the same.

TRANSPOSITION OF WEAVES.

There are a variety of ways in which weaves can be transposed, I here give the manner of the various transpositions shown in plates.

In transpositions 18, 19, 21, 22, 24, 25, 27, 28, 30, 31, 33, 35, 36, 38, 39, 40, 42, 43, 44, 46, 47, 48, 49, 50, 51, 53, 54, 55, 56, 58, 59, 60, they are all transposed by taking first bar and

the last, third and second, fifth and fourth and so on taking an odd and an even alternately.

62, 63, 64, 65, 66, 69, 70, 72, 73, 74, 75, 76, 77 are just transposed the same, only in place of taking the first and last bar and so on, take the first and last harness, i. e., transposing upward instead of across. 81, 83, 85, 87, 89, 91, 93, 95, 97, 100 and 101 are all transposed upwards taking all the odds first, then all the evens as 1, 3, 5, 7, 2, 4, 6, and so on.

In transposing the 2, 3 and 4 ply cloths, take one bar of each fabric across for the first transposition, and one harness of each upward for the second transposition, taking the second transposition from the first transposition and the first transposition from the original weave.

In transposing warp backs as in 162, 163, take one of each fabric going upwards.

In filling backs, take one of each fabric going across.

In again printing and binding (for the fourth time) in a handy pocket volume those chapters upon textile designing of which the third edition was published in the American Wool and Cotton Reporter and then bound in book form, we desire to express our gratitude for the fact that this is the fourth edition of this "Textile Designers' Pocket Manual." The third edition was exhausted some weeks ago and in printing this fourth edition we cannot but express our surprise and gratification at the popularity of this little book.